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DISEASES CAUSED BY BACTERIA AND FUNGI.

LESBOUYRIES, & BERTHELON. (1935). La streptococcie du porc. [**Streptococcus Infection in Swine**].—*Rec. Méd. vét.* **111.** 920-935. 2 figs. [10 refs.]

Infection of the pig by a streptococcus (*Str. suis*) is considered to cause a specific contagious disease. The acute form occurs as a septicaemia and is found in young pigs and also in pregnant sows. In the young pig, the lesions observed are mainly congestion and haemorrhage of the various organs ; in the sow, the uterus is congested and contains a small quantity of fibrinous exudate. In the young pig the subacute form causes articular lesions, bronchial pneumonia, endocarditis and lesions in the skin and nervous system, while in the sow endometritis and mastitis are the prominent lesions. The chronic form of the disease usually follows the subacute form.

Streptococcus infection in the pig may cause a high mortality and in some outbreaks may cause the death of 50 per cent. of young pigs. Animals which recover from an attack usually become carriers and help to maintain the disease on the premises ; sows may transmit the disease to their progeny.

Regarding the diagnosis of the disease, the authors attach importance to the fact that the death of a number of young pigs due to this disease is usually associated with uterine affection of the sow. In addition, there are usually lesions of endocarditis or arthritis and the absence of ulceration of the intestinal tract. A positive diagnosis may be arrived at with regularity by isolating the streptococcus from the heart blood in the acute disease, or from the lesions in the subacute or chronic forms. The authors state that the organism occurs usually in the form of a diplococcus or, if it occurs in chains, the elements are well separated. It appears that this streptococcus may be isolated from the normal udder of the sow where it may cause a latent infection. There does not seem to be an effective method of treatment, and methods of prevention should be directed towards improved hygienic conditions in the piggery. A certain degree of protection can be given to the young pigs by the use of an autogenous vaccine.—S. J. EDWARDS.

ENGELBRECHT, Mildred A. (1935). **The Biological Characters of the Streptococcus commonly associated with Mastitis** (*Str. Agalactiae*).—*Cornell Vet.* **25.** 313-333. 2 figs., 2 tables. [Numerous refs.]

The author studied non-haemolytic streptococci from cases of chronic mastitis,

from bovine faeces, from the throats of dairy employees and human lesions. A large number of carbohydrates and other test substances were used, but only lactose, mannite, salicin, raffinose, inulin and sodium hippurate were found to be of real value. With these tests all of 103 strains of non-haemolytic streptococci, "α type", from the cow's udder and commonly associated with mastitis were found to be alike and to have the characters now well recognized as those of *Str. agalactiae*. These strains are the same as those previously referred to by HADLEY and FROST as *Str. mitis*, but are distinguished from *Str. mitis* by the fact that they split sodium hippurate. The author also considers them as distinct from *Str. mastitidis*, which she regards as β haemolytic. Ten strains from cow's faeces fermented inulin and raffinose and did not split sodium hippurate ; these are believed to be *Str. bovis*.

The human strains were less homogeneous. About half behaved like *Str. bovis*, the remainder did not ferment raffinose or inulin or split sodium hippurate, and are believed to be properly called *Str. mitis*.

[The author's distinction between *Str. agalactiae* and *Str. mastitidis* on grounds of haemolysis may be questioned because strains which have the characters assigned by her to these organisms have been shown to be similar serologically].

—A. W. STABLEFORTH.

TORREY, J. C., & MONTU, Elizabeth. (1936). **Comparative Observations on Streptococci from Human Gastro-Intestinal Ulcerations and Bovine Mastitis.** —*J. infect. Dis.* **58.** 105-114. 7 tables. [20 refs.]

The authors have made a comparative study of (1) representative strains of the streptococcus claimed by SAUNDERS to be constantly associated with ulceration of the gastro-duodenal region and with gastric carcinoma, and to be identical with three strains of streptococci from milk which he examined from cows affected with bovine mastitis ; (2) authentic strains of the kind regarded by BARGEN as the primary aetiological factor in the so-called non-specific ulcerative colitis ; (3) selected enterococci associated with the same disease, and (4) authentic strains of *Str. mastitidis* (*agalactiae*). They conclude from biochemical and serological data, firstly, that neither the Bargen nor Saunders groups are homogeneous, but that the strains they contain show certain cross-relationships and, secondly, that there is no significant relationship between any of these organisms and *Str. mastitidis*, *i.e.*, the organism associated with the common chronic bovine mastitis. Three strains from mastitis not related to *Str. mastitidis* did, however, show biochemical and serological relationships to certain of the human strains concerned to such a degree as to suggest a bovine origin for certain strains of this nature.—A. W. S.

TUNNICLIFF, Ruth. (1936). **Effect of Dissociation of Streptococci on their Fibrinolytic and Anticlotting Activity.**—*J. infect. Dis.* **58.** 92-97. [13 refs.]

Tunnicliff has confirmed and extended the earlier observation that the fibrinolytic action of haemolytic streptococci of human origin is apparently a function of the virulent smooth form, this power being lost as the strain becomes rough and regained on reversion to the smooth form.

Neither smooth nor rough cultures of certain *Str. viridans* or non-haemolytic streptococci of human origin which were examined had any fibrinolytic action, but smooth cultures prevented clot formation.

Plasma clot from convalescents from haemolytic streptococcus infections not only resisted the lytic action of the haemolytic streptococcus but also the anti-clotting property of *Str. viridans* and non-haemolytic streptococci.

Plasma clot from patients infected with one of the last-named organisms resisted only the anticlotting action of these organisms.—A. W. STABLEFORTH.

LEVY, M. H. (1935). Das Wesen der Streptokokkendifferenzierung nach Warren Crowe. [**Warren Crowe's Method of Differentiation of Streptococci**].—*Zlb. Bakt. I.* (*Orig.*). **135.** 391-402. 7 plates, 1 table. [Numerous refs.]

Levy has examined the cultural, morphological and biological characters of a number of strains of streptococci, paying particular attention to the use of Warren Crowe's chocolate agar method of differentiation. A series of plates illustrating the appearance of the colonies on the latter medium and on agar slopes, and the morphology of the streptococci from agar slopes and condensation water, is also given. It is concluded that Warren Crowe's classification is " entirely dependent upon the presence of phases, reversible variants (modifications) of species and type". These phenomena are constant enough, when suitable media are used, to permit certain diagnosis by an experienced observer. In a succeeding publication by GRUMBACH the biological importance of these phases will be dealt with.
—A. W. STABLEFORTH.

SWIFT, H. F., LANCEFIELD, R. C., & GOODNER, K. (1935). **The Serologic Classification of Hemolytic Streptococci in Relation to Epidemiologic Problems.**—*Amer. J. med. Sci.* **190.** 445-453. 1 fig., 2 tables. [17 refs.]

In the past, all methods of classifying streptococci with regard to their pathogenicity have failed. Certain pathogenic haemolytic streptococci have been grouped by Lancefield into seven serological classes according to their reactions to the precipitin test, and it is possible to relate members of these groups to certain natural habitats ; thus, groups A and F are generally isolated from human beings and groups B and C generally from domestic animals. This method of serological grouping is of value since it indicates whether a certain strain is likely to be dangerous under any given set of circumstances. By further dividing the groups into types and sub-types by the precipitin absorption test, the course of epidemics in a limited community can be followed accurately.—E. J. PULLINGER.

TILLETT, W. S., & GARNER, R. L. (1933). **The Fibrinolytic Activity of Hemolytic Streptococci.**—*J. exp. Med.* **58.** 485-502. 5 tables. [8 refs.]

Broth cultures of β haemolytic streptococci derived from human patients and filtrates of these cultures are capable of rapidly liquefying human fibrin clot. The fibrinolysis occurs most quickly when oxalated plasma or fibrinogen is mixed with active culture material and clot formation then induced with calcium chloride. All of 28 strains isolated from various streptococcus infections were capable of fibrinolysis. Plasma clot is liquefied in about ten minutes, fibrin clot in about two minutes. Of 18 animal strains only three, all of which showed mucoid colonies, were capable of liquefaction. Thirty-eight strains of other bacterial species, including pneumococci and *viridans* streptococci, gave negative results.

Plasma from many patients recovered from acute haemolytic infections is highly resistant and their serum may have an antifibrinolytic action.

Normal rabbit fibrin clot is resistant but, when human thrombin is used to clot rabbit plasma or fibrinogen, fibrinolysis is not prevented. It is suggested that the role of thrombin in determining the resistance or susceptibility of rabbit fibrin to dissolution offers a suggestive approach to problems relating to the underlying mechanism.—A. W. STABLEFORTH.

PLANET, N. (1935). Sur l'action fibrinolytique des streptocoques hémolytiques d'origine équine. [**The Fibrinolytic Action of Equine Haemolytic Streptococci**].—*C. R. Soc. Biol. Paris.* **120.** 169-172. [5 refs.]

Tests of the fibrinolytic activity of 12 equine strains of haemolytic streptococci

[see previous abstract], *Str. equi* (non-lactose fermenters) or *Str. pyogenes* (lactose fermenters), on 22 samples of plasma from normal horses showed that certain plasmas were lysed by 75 per cent. of the strains ; one strain lysed all plasmas. Human plasmas were never attacked.—A. W. STABLEFORTH.

HALLMICH, P. (1935). Ueber den Einfluss der Drusevaccine auf das Blutbild des Pferdes. **[Influence of Strangles Vaccine on the Blood Picture of the Horse].**—*Inaug. Diss., Berlin.* pp. 24. 15 tables. [9 refs.]

The literature relating to the use of vaccines in strangles and their effect upon the clinical picture and the cellular constituents of the blood is reviewed.

The case histories are given of 15 animals, of an average age of ten years, with tables of the total and differential blood counts made before and after the subcutaneous injection of a " methylene blue vaccine."—N. S. BARRON.

REICHARDT. (1935). Untersuchungen über Art und Häufigkeit des Vorkommens von Streptokokken und Staphylokokken im Wundeiter von Pferden. **[The Occurrence of Streptococci and Staphylococci in the Wound Pus of Horses].**—*Z. Veterinärk.* **47.** 321-335. [Numerous refs.]

Reichardt examined pus from 33 wounds, fistulae, etc., in horses. Both streptococci and staphylococci were found in most cases and in some of these other bacteria were also present. In a few cases staphylococci or streptococci were isolated alone or with some other bacterium.

No attempt is made to correlate the characters of the organisms isolated with those of streptococci or staphylococci isolated by others, or to fit them into the now well-known systems of classification based on biochemical, serological or toxin-producing characters.—A. W. STABLEFORTH.

LITTLE, R. B., & FOLEY, E. J. (1935). **Staphylococci Associated with Mastitis.** —*J. Amer. vet. med. Ass.* **87.** 637-649. 5 figs., 1 table. [13 refs.]

The authors conclude that staphylococci isolated from the secretion of severe or fatal cases of bovine mastitis, from superficial abscesses of the skin of the cow's udder, and also certain strains from normal milk, form a definite group with common characteristics. Freshly isolated strains are pathogenic for mice. Acute severe mastitis was produced by introduction of small numbers of staphylococci from a skin abscess, small abscesses also appearing in the skin of the udder. The literature regarding staphylococcus mastitis and the characters of the associated staphylococci is discussed and details given of 20 strains examined by the authors, of which 12 are regarded as typical *Staph. aureus*, the remaining eight showing some characters regarded as differential. The fact that large numbers of potentially pathogenic staphylococci may be unassociated with any disturbance, and that staphylococcus mastitis often follows parturition, is discussed. It is suggested that in cases of mastitis there is a deficiency of an inhibitory substance usually responsible for controlling the multiplication of staphylococci in the udder.—A. W. S.

NÉLIS, P. (1936). Nouveau milieu de culture pour la production de la toxine staphylococcique. **[New Culture Medium for Staphylococcus Toxin].**—*C. R. Soc. Biol. Paris.* **121.** 724-725. [3 refs.]

275 g. of chopped pig stomach and 10 c.c. of HCl are added to a litre of water. This is digested for 15 hours at 48°C.; heating to 100°C. stops the process. After straining and cooling, fat is removed by filtration. The pH is adjusted to 7·5 and then, on heating to 60°–70°C., a precipitate appears which is removed by filtering through fine paper. The medium is sterilized by heating at 110°C. for 15 to 20 minutes or by filtration.—A. W. TAYLOR.

RAMON, G. (1936). Sur la production de la toxine et de l'anatoxine staphylococciques. [**The Production of Staphylococcus Toxin and Anatoxin**].—*C. R. Soc. Biol. Paris.* **121.** 375-379. [10 refs.]

The rapid production of staphylococcus toxin in quantity has been successfully accomplished in fluid media (details of three of which are given) exposed to an atmosphere containing 20 to 25 per cent. of CO_2. Anatoxin of relatively high antigenic value was prepared by the addition of formol at a concentration of 3·5 c.c. per litre of toxin followed by incubation for ten days at 39°C.—J. W. EMSLIE.

ROBERT, P., & ROSENTHAL, A. (1935). Ueber den Einfluss von Säuren, Alkalien und Kochsalzlösung auf den Verlauf der experimentellen Streptokkeninfektion und Milzbrandinfektion beim Kaninchen und beim Meerschweinchen. [**The Influence of Acids, Alkalis and Common Salt Solutions on the Course of Experimental Streptococcal Infections and Anthrax in Rabbits and Guinea Pigs**].—*Zlb. Bakt. I. (Orig.).* **135.** 220-227. 5 tables. [17 refs.]

Feeding experiments in conjunction with injections of neutral salts were carried out to try to render the acid-base balance of the blood either acid or alkaline and to test the effect on the course of streptococcal infection in rabbits and anthrax infection in guinea pigs. The " alkalosed " animals were fed exclusively on green food (grass and roots) and received intraperitoneal injections of sodium bicarbonate before and during infection. The " acidosed " animals were fed on oats and milk and were similarly injected with ammonium or calcium chloride solutions. The rabbits were infected subcutaneously with haemolytic streptococci (1/50 c.c. of 24-hour blood broth culture) and the guinea pigs with anthrax bacilli (1/20,000 of a loop in broth – 75 to 150 bacilli per injection). Results proved that both the acid and alkaline treatment slowed up the course of infection and even saved the lives of several animals.

In a further experiment in which intraperitoneal injections of sodium chloride were given, 17 of the 20 animals survived anthrax infection. The 15 control animals died within three days.—M. BURKE.

ALMEYEFF, H. (1935). Anthrax bei Katzen. [**Anthrax in Cats (Lynx)**].—*Dtsch. tierärztl. Wschr.* **43.** 820-821.

A detailed description of the *post-mortem* findings in two lynx that had died from anthrax. It was found that the anthrax was the septicaemic form.—G. D. M.

RAUTMANN, H. (1935). Erbfaktor für das Tuberkulosegeschehen. [**Hereditary Factors in Tuberculosis**].—*Dtsch. tierärztl. Wschr.* **43.** 577-580.

After some general statements on the control of bovine tuberculosis in Germany by the Ostertag method, the author considers possible hereditary disposition to tuberculosis in cattle. In his opinion such a hereditary factor is of no importance, but he allows that certain breeds or families of cattle may be predisposed by reason of certain peculiarities in their anatomical conformation. Many cattle of good conformation and constitution probably acquire infection, but are able to overcome it, while poorer specimens develop the disease.

The author holds that, if susceptibility is hereditary, so also is resistance, and he quotes several workers who have supported this contention, some declaring that they have found a high resistance in the progeny of tuberculous animals.
—M. BURKE.

BÖHMER, G. (1934). Tuberkulose bei Foeten und Kälbern. [**Tuberculosis of Foetuses and Calves**].—*Inaug. Diss., Berlin.* pp. 28. 1 table. [Numerous refs.]

Of 300 foetuses from condemned tuberculous dams, nine were tuberculous, all being at the fourth month of gestation or more. Only one of these came from a tuberculous uterus : in that particular case, the uterine lesions were very extensive whilst the lesions in the foetus were very slight. These figures are considered as evidence that congenital tuberculosis is uncommon. Two of the strains of tubercle bacilli which were isolated from these foetuses were of the avian type, and it is noteworthy that the lesions both in the foetuses and in the dams were quite extensive.

Twenty-three calves, not from the above series of cows, when slaughtered for veal when less than four weeks old, showed caseating and even calcifying lesions. Such cases were possibly intra-uterine in origin.—E. J. PULLINGER.

MOODIE, R. R. (1936). **The Incidence of Tuberculosis in Dairying Herds.**—*Vet. Rec.* **16.** 239-240. 1 table.

The author tabulates the results of testing in four herds in Scotland, tested for the first time. The herds contained a total of 123 animals made up of 77 cows, 43 young stock and 3 bulls. The incidence of reactors varied from 1 in 34 to 13 in 38. A total of 31 reactors was found, comprising 1 bull, 3 young animals and 27 cows.

The test used was a single injection of tuberculin into the caudal fold, and the results were read in four days.—W. J. IRONSIDE.

THOMAS, T. R. (1936). **A Further Report on the Incidence of Tuberculosis by the Double-Intradermal Tuberculin Test, in Self-Contained Herds.**—*Vet. Rec.* **16.** 241. 2 tables.

This report gives the result of testing 22 herds in Wales, containing a total of 662 animals, made up of 18 bulls, 435 cows and 209 young stock. Eleven of the herds showed no reactors and but one reactor was found present in each of seven. The total of reactors was 18. The author states that eight of the 22 herds are in the Attested Herd Scheme and no particulars are given relating to previous testing in the remainder.—W. J. IRONSIDE.

RASCHERT, H. (1935). Entsprechen die Lichtverhältnisse in unseren Rinderstallungen den gesundheitspfleglichen Anforderungen und lässt sich ein Einfluss derselben auf das Vorkommen der Tuberkulose nachweisen ? **[Effect of Illumination on Health of Cattle and their Resistance to Tuberculosis].**—*Inaug. Diss., Berlin.* pp. 24. 8 tables. [8 refs.]

The author examined many cow byres for their degree of illumination, using an instrument which he terms a " Luxmeter " to determine the amount of light per cow. The majority of byres were deficient, but no correlation between light and the incidence of tuberculosis could be found. German writers recommend a window to floor area ratio of 1 : 20.—J. E.

GOYAL, R. K. (1936). Recherches des bacilles tuberculeux dans le cerveau apparemment sain des animaux tuberculeux. **[The Presence of Tubercle Bacilli in the Apparently Healthy Brains of Tuberculous Animals].**—*C. R. Soc. Biol. Paris.* **121.** 223-224. [1 ref.]

Several cases of the recovery, by culture and by animal inoculation, of tubercle bacilli from the brains of experimentally infected guinea pigs and rabbits are recorded. Most of those involved the bovine strain which had been administered either intravenously or subcutaneously, whereas only once was the human strain recovered after similar administration. It would appear that cerebral localization

of bovine tubercle bacilli is particularly liable to follow intravenous inoculation. —J. W. EMSLIE.

DADDI, G. (1935). Su un caso di infezione tubercolare spontanea della cavia, con localizzazione iniziale nei gangli cervicali. [**A Case of Spontaneous Localized Tuberculosis in a Guinea Pig**].—*Boll. Ist. sieroter. Milano.* **14.** 355-359. [18 refs.] [German summary : abst. from orig.]

For many years, the author has made it a practice to inject suspected tuberculous material into guinea pigs both subcutaneously and into one cervical gland. Since numerous workers have reported that acid-fast bacilli may be present in the lymphatic glands of normal guinea pigs, the other cervical gland has always been removed at the time of injection and carefully examined. In one case, acid-fast bacilli were found in this gland and, when the animal was killed, typical tuberculous lesions were found in other lymphatic glands, the lungs and spleen. The bacilli proved to be bovine in type.—J. A. NICHOLSON.

BOQUET, A., & LAPORTE, R. (1936). Sur la dispersion des bacilles de surinfection dans l'organisme des cobayes tuberculeux. [**The Dispersion of Tubercle Bacilli after Reinfection in Tuberculous Guinea Pigs**].—*C. R. Soc. Biol. Paris.* **121.** 211-213.

Guinea pigs were inoculated subcutaneously in the right thigh with a highly virulent S strain of bovine tubercle bacillus and two months later with a human eugonic strain into the left thigh. By culture, it was shown that the secondary strain tended to remain localized at the site of inoculation for about two weeks, after which a few bacilli gained the regional lymphatic glands but never the spleen. By contrast, the primary infection reached the regional glands in three to seven days and the spleen by the 15th day.—J. W. EMSLIE.

SCHMIDT-LANGE, W. (1935). Die Bedeutung unzureichender Ernährung für die Infektion weisser Mäuse mit Geflügeltuberkelbazillen. [**The Effect of Nutritional Deficiency on the Infection of White Mice with Avian Tubercle Bacilli**].—*Arch. Hyg., Berl.* **115.** 38-52. 4 tables. [Numerous refs.]

200 mice were used to study the influence of nutrition upon the development of infection with avian tubercle bacilli. It was found that tuberculous lesions were much more extensive in mice which were artificially infected after being starved than in those which had received a normal diet.—E. J. PULLINGER.

PIASECKA-ZEYLAND, E., & SZNAJDER, W. (1935). Beitrag zur Typenbestimmung von Tuberkelbazillenstämmen und zur Frage der Häufigkeit der bovinen Infektion beim Menschen. [**The Typing of Tubercle Bacilli and the Frequency of Bovine Infection in Man**].—*Beitr. Klin. Tuberk.* **86.** 148-150. [4 refs.]

Whilst bovine tuberculosis is wide-spread in Posen and other parts of Poland, infection of human beings with the bovine type is not common, apparently because infants generally receive their mother's milk and raw milk is seldom drunk.

Of 27 cases in adults and 31 in children, which were typed, only 4 were bovine ; 2 of these were abattoir attendants : the other 2 had drunk raw milk.—A. W. S.

STREMPEL, W., MÜNDEL, O., & HUBER, L. (1935). Ueber die Häufigkeit des bovinen Typus der Tuberkelbazillen bei menschlicher Tuberkulose im Untersuchungsbezirk Bern. [**Bovine Type of Tuberculosis in Man in Berne, Switzerland**].—*Schweiz. med. Wschr.* **65.** 554. 1 table. [5 refs.]

Of 200 strains of *Mycobact. tuberculosis* isolated from human beings in the district of Berne, 183 (91·5 per cent.) were of the human type and 17 (8·5 per cent.) of the bovine. Strains of the bovine type were more frequent in children than in adults, and were also more frequent in tuberculosis of the cervical and axillary glands or abdominal tuberculosis than in the pulmonary form. The presence of the bovine type showed a high correlation with the consumption of raw milk but none with residence in town or country.—A. W. STABLEFORTH.

MUNRO, W. T., & SCOTT, H. (1936). **Meningeal Tuberculosis. Epidemiology and Type of Tubercle Bacilli.**—*Lancet.* **230.** 393-395. 2 tables. [5 refs.]

This investigation deals with 50 cases of meningeal tuberculosis met with from 1924 to date. In 27 cases, growths were obtained by direct inoculation of suitable media and in the remaining 23 cases by inoculation of guinea pigs. Of the 50 cases 18 (36 per cent.) proved to be due to bacilli of the bovine type. Table I shows the age-distribution according to type :–

	Total.	Human.	Bovine.
0 – 5 years	20	9	11 (55 per cent.)
5 –15 ,, ...	18	14	4 (22·2 ,, ,,)
Over 15 years	12	9	3 (25 ,, ,,)
Total	50	32	18 (36 ,, ,,)

Table II shows the difference between urban and rural areas :–

	Urban.		Rural.	
	Human.	Bovine.	Human.	Bovine.
0 – 5 years ...	9	5	–	6
5 –15 ,, ...	11	2	3	2
Over 15 ,, ...	5	–	4	3
Total ...	25	7	7	11 (60·1 per cent.)

—BRENNAN DEVINE.

SATO, S. (1935). Ein Fall papulo-nekrotischer Tuberkulide, hervorgerufen durch Geflügeltuberkelbazillen. [**A Nodule in the Skin of a Girl caused by the Avian Type of Tubercle Bacillus**].—*Arch. Derm., Berl.* **171.** 335-350. 5 figs., 1 table. [Numerous refs.]

An avian strain of tubercle bacillus was isolated from a necrotic nodule of the skin of a 19-year-old girl. Histologically the nodule showed no characteristic features, being of a granulomatous type. The patient gave a strong allergic reaction to tuberculin made from the homologous strain, but little or no reaction to tuberculin made from human or bovine strains or from saprophytic strains of *Mycobacterium.*

—E. J. PULLINGER.

HAGAN, W. A. (1935). **Vaccination against Johne's Disease.**—*Cornell Vet.* **25.** 344-353. 1 table. [2 refs.]

The author carried out an experiment to test the value of immunization by subcutaneous injection with live culture as advocated by VALLÉE and RINJARD [(1926). *Rev. gén. Méd. vét.* **35.** 1].

The vaccine employed was prepared by growing a number of strains of *Mycobact. paratuberculosis* (bacillus of Johne's disease) for two months on synthetic

media which contained heat-killed *M. phlei.* At first a dose of 50 mg. of the organisms suspended in 1 c.c. of sterile paraffinum liquidum was used but, as this produced a marked local reaction, the 50 mg. was suspended in 5 c.c. of normal saline solution, a change of vehicle and of dilution.

Twenty calves ranging from two to six months of age were used for the experiment. Ten were vaccinated subcutaneously at intervals of six months, the remainder being retained without treatment to serve as controls. Both groups were exposed to natural and artificial infection and were under observation for two and a half years. The surviving animals were then slaughtered and examined.

Six of the controls survived ; three were free from lesions and three were affected ; four of the controls died of the disease. Only one of the vaccinated group succumbed to the infection, but lesions were detected in the intestines of seven of them : one animal remained healthy.

The author does not draw any definite conclusions from the results obtained.
—F. Blakemore.

Levine, P., & Frisch, A. W. (1936). **On Differentiation in the Suipestifer Group and on Resistance to Phage.**—*J. Immunol.* **30.** 63-88. 12 tables. [Numerous refs.]

Thirteen strains of *Salmonella cholerae-suis*, including *Hirshfeld*, *Kunzendorf* and *Glässer-Voldagsen* varieties, were examined with regard to bacteriophage specificity, and were compared with other closely related members of the genus. A very close parallelism in antigenic and bacteriophage specificity was demonstrated. Such specificity was only revealed by means of special bacteriophage absorption tests, the technique of which is described. Certain small differences within the *cholerae-suis* group were demonstrated, and these differences were related to heat-stable factors and not to the flagella. It is thought that in future it may be possible to demonstrate very detailed somatic differences by means of phage specificity tests. It is further suggested that bacterial resistance to the lytic action of phage depends upon variations in antigenic composition. Thus factor A enables an organism to absorb phage, whilst factor B inhibits lysis. An organism containing factor A only will absorb phage and be lysed. One containing factor B only will not absorb phage and resists lysis. One containing both A and B will absorb phage but will resist lysis.—E. J. Pullinger.

Strozzi, P. (1934). Il paratifo dei vitelli in Italia. **[Calf Paratyphoid in Italy].** —*Clin. vet., Milano.* **57.** 337-354. 3 figs. on 1 plate, 4 tables. [44 refs.]

Fourteen cases of calf paratyphoid were observed out of 160 *post-mortem* examinations on calves carried out at the Veterinary Research Laboratory, Brescia.

The causal agent was found to be a salmonella identical with *S. enteritidis* var. *Dublin.*

Necrotic miliary centres in the liver and spleen, and enlarged spleens were found to be the most important and most usual lesions.—F. Veglia (Turin).

I. de Blieck, L., & Jansen, J. (1935). Paratyphus bij zilvervossen. **[Paratyphoid of Silver Foxes].**—*Tijdschr. Diergeneesk.* **62.** 457-464. 1 table. [16 refs.] [English, French and German summaries : abst. from orig.]

II. de Blieck, L., & Jansen, J. (1935). De bestrijding der zilvervossensalmonellose. **[Control (Eradication) of Paratyphoid Infection in Silver Foxes].**—*Ibid.* 1247-1248.

III. Jansen, J. (1935). Snel-agglutinaties met salmonella-antigenen bij onderzoek op salmonella-infectie (bij kippen, eenden konijnen en zilvervossen).

[**Diagnosis of Salmonella Infections by Rapid Agglutination**].—*Ibid.* 1253-1263. 3 tables. [English, French and German summaries : abst. from orig.]

I. *Salmonella enteritidis* was isolated from the carcasses of 16 foxes that had died on Dutch fox farms ; this organism was also found in the faeces of a diseased fox and in fleas of foxes from an infected farm. A vaccine prepared from the organism was used and is said to have checked the disease. Paratyphoid is seen in silver foxes more than eight weeks old shortly after they start to eat, and causes high mortality. The symptoms are diarrhoea and weakness of the lumbar region. The eyes are sunken. Icterus is very often present. According to the literature, paratyphoid in silver foxes may be brought about also by *S. typhi-murium*, *S. cholerae-suis* var. *Kunzendorf* and *S. enteritidis* var. *Danysz*.

II. In continuation of the above paper the authors record limited good results with prophylactic vaccination on infected fox farms. They therefore recommend prevention by hygienic measures based on the agglutination test (see below).

III. The author studied salmonella infections in fowls, ducks, rabbits and silver foxes. The value of agglutination tests with some salmonella-antigens was specially investigated. The main object was to show that the *S. pullorum* formol antigen can be used to trace all those salmonella infections in which the IX factor is present [see this *Bull.* **5.** 63]. The *S. pullorum* formol antigen gave good reactions in bacillary white diarrhoea of fowls (*S. pullorum* infection), in ducks (*S. enteritidis* var. *Essen* infection), in silver foxes (*S. enteritidis* var. *Dublin* infection), and in rabbits (infection with *S. typhi*, *S. enteritidis* var. *Moscow* and *S. enteritidis*).

The *S. pullorum* antigen gives clear reactions in the rapid serum method, and in the rapid whole-blood method the reaction is not disturbed by agglutination of the red blood corpuscles. The *S. pullorum* antigen is already regularly used in practice in the control of salmonella infections in silver foxes and ducks in Holland.—M. J. J. Houthuis (Rotterdam).

Reis, J., & Reis, A. S. (1934). Profilaxia da pulorose em São Paulo. [**Prophylaxis of Bacillary White Diarrhoea in São Paulo**].—*Arch. Inst. biol. Def. agric. anim., S. Paulo.* **5.** 51-53. [6 refs.] [English summary : abst. from orig.]

Action taken by the poultry farmers in Brazil to improve their stock has led to the introduction of *Salmonella pullorum* infection and, assisted by the improvements in the methods of hatching, the disease has increased rapidly. An infection rate of 27 per cent. has been encountered in birds recently imported from the United States of America, and a large proportion of outbreaks are directly traceable to imported stock. An attempt has been made to control the disease by intensive propaganda and by provision of free antigen. The percentage of reactors encountered is now 1·3 as compared with 9·3 when the testing was commenced two years ago.—R. S. Roberts.

Stockmayer, W. (1936). Untersuchungen über die Bangbakterieninfektion des Euters, über den Verlauf der Ausscheidung der Bangbakterien und ihre Feststellung. [**Brucella Infection of the Udder**].—*Z. InfektKr. Haustiere.* **49.** 46-78. 6 tables. [Numerous refs.]

A long and careful study of the manner in which *Br. abortus* is excreted in the milk is recorded, and a very useful bibliography is appended.

First-calf heifers, some of which had aborted and some of which had normal pregnancies, excreted *Br. abortus* in their milk on the first day of lactation. Daily cultural examinations revealed that the numbers of organisms which were excreted fluctuated markedly and, on some occasions, none were excreted. Excretion often

continued for many months. Agglutinins to *Br. abortus* were sometimes found in the whey immediately after the commencement of lactation. The titre bore no reliable relationship to the degree of excretion of organisms.

For the diagnosis of udder infections guinea pig inoculation was the most reliable test, though culture [see this *Bull.* **4.** 419.] is the cheapest and quickest method. The relative value of whole milk, cream and sediment as seed for culture is considered. Triplicate plating, using all three, is advocated. The practical application of the foregoing findings to the field control of contagious abortion is discussed.—E. J. PULLINGER.

CALISTI, E. (1935). Questions pratiques se rapportant aux brucelloses. [**Practical Questions relating to Brucella Infections**].—*Boll. Sez. ital. Soc. int. Microbiol.* **7.** 301-304. [In French].

Observations are made on bovine contagious abortion in a district in which it was not known to be present.

A group of 142 animals was collected for slaughter ; some had been fattened outside the district and others locally ; 50 per cent. of the former and 18 per cent. of the latter were positive reactors to the agglutination test for *Br. abortus* and/or *Br. melitensis* ; otherwise the animals were healthy, and after slaughter the carcasses were passed for human consumption.

A second group, consisting of 199 animals, was imported from an adjacent district for slaughter. They were mostly cows which had been affected with retention of the placenta or sterility, or which had aborted or produced dead or weakly calves at full term, 70 per cent. of them reacting positively.

Taking all reactors into consideration, 15·5 per cent. reacted positively only against *Br. melitensis*, 27·8 per cent. only against *Br. abortus*, and 56·7 per cent. against both.—E. W. ASCOLI.

GILDE, H. (1935). Die Bangbrucellose des Pferdes als Ursache von Widerrist- und Genickleiden. [*Brucella abortus* **Infection of the Withers and Poll of the Horse**].—*Inaug. Diss., Berlin.* pp. 55. 1 table. [Numerous refs.]

Considering an agglutination titre of below 1 : 100 as negative, the author found that 83 per cent. of 52 horses treated for poll-evil or fistulous withers at the Veterinary Institute of the Königsberg University were infected with *Br. abortus*. In 12 cases the organism was isolated from the exudate of the lesions.

Horses on large farms were also examined and, on two farms containing herds of cattle affected with contagious abortion, most of the healthy working horses gave positive agglutination reactions for *Br. abortus*. In further tests on farms in East Prussia a large proportion of the horses on infected farms were reactors.—J. E.

NERI, A. (1935). Brucellosi ed industria zootecnica nello Spoletano. [**Brucella Infection in Cattle in the Spoleto District (Italy)**].—*Azione vet.* **4.** 286-291.

As the result of tests carried out, it was found that *Br. abortus* infection was prevalent and also that many cows were infected with *Br. melitensis*. The author considers, however, that the strain of this organism affecting cattle is attenuated since undulant fever is not prevalent in the district.—J. A. NICHOLSON.

GUIDI, G. (1934). Dell'aborto epizootico in Provincia di Forli. [**Epizootic Abortion in the Province of Forli**].—*Arch. ital. Sci. med. colon.* **15.** 919-931. 1 chart, 1 map. [English, French and German summaries : abst. from orig.]

An account is given of the lesions produced by *Brucella abortus* in animals and the methods employed for its diagnosis. It is stated that, although *Br. abortus*

has been accused of causing abortion in women, it has never been isolated from material obtained from such cases. Statistics collected for several years in the Forli district of Italy show that the number of cases of bovine contagious abortion and undulant fever has increased ; the author is of the opinion, however, that there is no connexion between the incidence of the two infections. Even so, he considers that the public should be warned of the danger of infection from affected animals.—J. A. NICHOLSON.

I. WIGHT, A. E. (1936). **The General Progress of the Cooperative Bang's Disease Project.**—*J. Amer. vet. med. Ass.* **88.** 249-253.

II. FOSTER, S. B. (1936). **Bang's Disease Control in Oregon.**—*Ibid.* 253-257.

III. FITCH, C. P. (1936). **The Results of Retests in the Federal Bang's Disease Project.**—*Ibid.* 258-273. 9 tables.

IV. ERNESTI, S. (1936). Betrachtungen über zu erwartende Erfolge bei der Bekämpfung des seuchenhaften Verkalbens (Bang-Infektion) der Rinder. **[The Expected Results in Control of** *Brucella abortus* **Infection].**—*Tierärztl. Rdsch.* **42.** 228-233. [14 refs.]

V. —. (1936). Die Bekämpfung des seuchenhaften Verwerfens der Rinder in Oesterreich. **[Control of** *Br. abortus* **Infection in Austria].**—*Münch. tierärztl. Wschr.* **87.** 102-103.

I, II & III. Voluntary eradication of *Br. abortus* infection by farmers receiving financial assistance has proved very satisfactory. Technically the scheme presents no novel features. The campaign has been accelerated by transferring the activities of already existing anti-tuberculosis organizations to the control of contagious abortion, as well as by disseminating appropriate propaganda amongst farmers. If applied vigorously, standard methods of control are adequate for the elimination of the disease. The term " vigorous application " includes very frequent retests of doubtful reactors, of infected herds and of any new stock to be introduced into the herd.

IV. In theory, tuberculosis and contagious abortion should be controlled simultaneously. Farmers who cannot afford to eliminate infected stock would need seven sets of byres, *viz.* :–

(a) TUBERCULIN NON-REACTORS. — (1) calves ; (2) *abortus*-positive adults ; (3) *abortus*-negative adults, and (4) calving byre.

(b) TUBERCULIN REACTORS. — (5) *abortus*-positive adults ; (6) *abortus*-negative adults, and (7) calving byre.

V. The regulations for the control of contagious abortion in Austria contain no unusual features.—E. J. PULLINGER.

DIMOCK, W. W. (1934). **Prevention and Eradication of Bang's Disease.**—*Circ. Ky agric. Exp. Sta.* No. 41. pp. 12.

The author is of the opinion that the eradication of *Brucella abortus* infection by means of segregation of infected animals should be carried out wherever possible. The methods by which this may be attempted are described and special stress is laid on the importance of testing all animals over the age of five months.

The viability of *Br. abortus* is also discussed. No experimental data are given but it is stated that the organism lived less than 5 hours when exposed to direct sunlight, 5 days on sacking at room temperature, 30 days on sacking in a basement, and 4 days in soil dried quickly. In wet, unheated soil, in water, in stable manure and in material containing nutrient it lived from 60 to 120 days.—F. BLAKEMORE.

SCHUBERT, B. (1935). Die Flockung zum Nachweis der Bang-Infektion der Rinder (Vorläufige Mitteilung). **[The Flocculation Test for the Diagnosis**

of Bovine Contagious Abortion].—*Tierärztl. Rdsch.* **41.** 775-777. 2 tables. [4 refs.]

Although the means of assessing the relative value of the various methods was by no means perfect, Meinicke's lipoid fixation reaction and certain modifications had been reported upon the most favourably.

MENCH, WITTE and SACHWEH all emphasize the simplicity of this reaction and its specificity. They assert that the utilization of the specific antigen is the important factor: the antigen used in the test from which this one has been developed was non-specific.

The technique of the modified Meinicke's flocculation test as described by SACHWEH is given in detail. The author also records the results which he obtained when making comparative tests upon bovine blood, using the flocculation, agglutination and complement-fixation tests. He concludes that Sachweh's flocculation test is, at least, as reliable as the other two methods.—K. D. DOWNHAM.

ZELLER, H., & STOCKMAYER, W. (1935). Prüfung einiger Abortusvakzinen auf ihre Schutzwirkung gegen das seuchenhafte Verwerfen der Rinder. [**Trials of Some Anti-*abortus* Vaccines on Cattle**].—*Z. InfektKr. Haustiere.* **48.** 77-94. 3 tables.

The authors have tested the protective power of certain recently introduced vaccines, *viz.*, a vaccine consisting of *Brucella abortus* in a 10 per cent. solution of chinosol introduced by Lentz, one consisting of *Br. abortus* in a solution of methylene blue (Weichlein) and a third of *Br. abortus* killed with diluted Lugol's iodine solution (Gminder); these were compared with a vaccine made by heating a glycerin broth culture, or a suspension of bacteria grown on agar, for two hours at 58° to 60°C. and carbolizing.

The experiments covered a period of two years. Thirty-two pregnant non-reacting heifers were used in the first year (eight being replaced by others in the second year on account of sterility), *viz.*, a group of six for each vaccine and eight controls. Three doses of vaccine were given at intervals of a fortnight and a test dose of culture given by the skin and conjunctival routes four weeks later. In the first pregnancy most of the animals, both vaccinated and controls, aborted; whilst in the second pregnancy, in those animals which had not become sterile, most of both the vaccinated and control groups carried their calves to full time, no significant difference in the two groups being found. Abortion was on the average a little later in the vaccinated groups, and sterility slightly less common as a sequel, whilst there was some suggestion that udder infection was less frequent, but the sum of these effects is not considered sufficient to make the use of any of the vaccines of practical value. Details are given of blood tests which were carried out every two to four weeks and of the bacteriological findings at *post-mortem* examination. *Br. abortus* was recovered from about half the animals, the sites most frequently infected being the udder (18 cows), mammary lymph glands (15 cows), uterus (7 cows) two to ten months after the last parturition, and the mesenteric lymph glands (5 cows). *Br. abortus* was recovered occasionally from other glands and once from the spleen, but never from the liver or bone-marrow.

The authors conclude that, in view of the uselessness of dead vaccines and the increasing necessity of avoiding the use of living vaccines, all emphasis should be laid on the value of hygienic measures based on blood tests.—A. W. STABLEFORTH.

DUBOIS, C. (1935). Essais de prémunition et de vaccination préventive contre la tuberculose [brucellose] ovine, caprine et bovine à l'aide de vaccines vivants préparés avec un excipient gras. [**Vaccination against Brucella Infection**

in Sheep, Goats and Cattle with Vaccine in a Fatty Base].—*Rev. Microbiol., Paris.* **1.** 460-466. [3 refs.]

[" Tuberculose " in the original title is obviously a misprint for " brucellose "].

The author outlines his experiments, not yet completed, on the immunization and premunization of cattle, sheep and goats against brucella infection by means of living organisms incorporated in a fatty excipient. He also gives his observations on the reactions.

An experiment designed to determine whether such a vaccine would constitute a source of infection for other animals seems to show that all the organisms injected remain localized and are not detectable in the blood, urine or milk.—G. O. Davies.

Di Mino, G. (1935). Ricerche sulla differenziazione della brucelle con particolare riguardo a ceppi isolati in Sicilia. **[The Differentiation of Brucella Strains with Particular Regard to those isolated in Sicily].**—*Boll. Ist. sieroter. Milano.* **14.** 123-127. 2 tables. [7 refs.] [German summary : abst. from orig.]

From the investigation of 36 strains of *Brucella* obtained from man, cattle, sheep and goats in Sicily, and of 21 bovine strains from northern Italy, the author concludes that brucella infection in Sicily is due solely to *Br. melitensis.* He considers the Manfredi-De Santis method of differentiation, using Petragnani's malachite green egg media, as the easiest, simplest and most reliable. The sulphur metabolism test was also found to be reliable, irrespective of whether the organism was cultured on Stafseth's medium, ordinary agar, serum agar or glucose agar. The bacteriostasis tests, using media containing methyl violet, thionine or pyronine, were less useful.—Norman Bisset.

Reiter, Dorothy O. (1936). **Studies on the Extraction of a Precipitable Substance from the Genus Brucella.**—*J. infect. Dis.* **58.** 45-58. 9 tables. [Numerous refs.]

Specific precipitable substances of a polysaccharide nature were prepared from strains of the bovine and porcine types of *Br. abortus* and from *Br. melitensis* by alcohol and saline extraction, followed by precipitation of the saline soluble constituents with excess of alcohol. These alcohol-insoluble substances precipitated both homologous and heterologous immune sera prepared by injection of heat-killed organisms into rabbits. The preparation from the bovine type of *abortus* was the most active, precipitating antisera to both the bovine and porcine types in dilutions of 1 : 50,000. An extract of the porcine type precipitated in dilutions of 1 : 10,000 to 1 : 25,000. The *melitensis* extract precipitated *melitensis* antiserum in a dilution of 1 : 5,000, the bovine type of *abortus* in dilutions of 1 : 2,500 to 1 : 5,000, and the porcine type in dilutions of 1 : 1,000 to 1 : 5,000.

Low dilutions of the precipitable substances were found to be antigenically active in the production of precipitating and agglutinating antibodies when injected into rabbits. Possibly this was due to the presence of a slight protein residue in the precipitate.

Agglutination tests carried out after absorption of immune sera with the precipitable substances showed reduction in the agglutination titre of both homologous and heterologous antisera to about the same extent, indicating that the differences observed in the substances may be quantitative rather than qualitative.

Results of these precipitation and agglutination absorption tests indicate a closer relationship between the bovine and porcine types of *abortus* than between these and *melitensis.*—N. J. Scorgie.

NAEGELI, O. (1935). Studien über die gegenseitige Beeinflüssung von Pilzkulturen auf künstlichen Nährböden. (Pilzkolonien als Nährböden für andere Mikroorganismen). **[Growth of Fungi on Artificial Media and Growth of Bacteria on Fungi Colonies].**—*Schweiz. med. Wschr.* **65.** 535-537. 4 figs., 1 plate.

Synergism, symbiosis and antagonism between micro-organisms growing on artificial media have been studied. Plates are included demonstrating the growth of fungal colonies on top of colonies of another species, *e.g.*, *Achorion schoenlini* on the surface of a colony of *Actinomyces*. Conditions suitable for such growth are discussed. It is considered that further work along these lines is desirable.
—E. J. PULLINGER.

STEPHENSON, M. (1935). **The Chemistry of Bacteria.**—*Ann. Rev. Biochem.* **4.** 593-614. [Numerous refs.]

During the past year the papers published, which have had some bearing on the subject of the chemistry of bacteria, have been many, and in this review the author mentions those which she considers are the most important. Fermentation, amino-acid breakdown, toxin formation, coloured sulphur bacteria and nitrogen formation are dealt with. The material included under the following headings is of particular interest :–

RESPIRATION.—Study of the " Atmungsferment " system by means of a spectroscopic study by *Clostridium pasteurianum* and *Acetobacter* : distribution amongst 45 species of bacteria of the constituents of the cytochrome spectrum [see this *Bull.* **5.** 701.] : phthiocol, the pigment of the human tubercle bacillus has been shown to be the oxidant of a reversible system with a low potential. The hydrogenase system has been shown to be reversible.

ANAEROBIC MECHANISMS.—Intact cells of many facultative anaerobes contain enzyme systems in virtue of which one substance can be reduced and another oxidized, *e.g.*, formates reduce nitrates, and it is inferred that upon such reactions anaerobic cells depend for energy.

ENZYMES.—The fibrinolysis of haemolytic streptococci has now been obtained in full activity in sterile cell-free filtrates from broth cultures of the organisms.

" All the haemolytic streptococcal strains isolated from human patients work on human fibrinogen, but only three-eighteenths of those of animal origin. An interesting specificity is shown in the reaction ; rabbit plasma clotted by rabbit thrombin is resistant to lysis by haemolytic streptococci of human origin, but rabbit plasma clotted by human thrombin is susceptible . . . ."

PROTEOLYSIS.—Washed suspensions and cell-free filtrates of *Cl. sporogenes* and *Cl. histolyticum* produced a proteolytic exo-enzyme capable of splitting proteins to polypeptides.

GROWTH.—Numbers of substances such as ascorbic acid, yeast ash and extract of some bacteria failed to stimulate growth of *Bacillus mycoides*. Yeast extract increased growth up to 400 per cent. but, as the number of cells increased, the size was diminished, *i.e.*, the stimulus is on cell division.—JAMES STEWART.

DISEASES CAUSED BY PROTOZOAN PARASITES.

CRAIG, C. F. (1936). **Some Unsolved Problems of the Parasitology of Amebiasis.** —*J. Parasit.* **22.** 1-13. [Numerous refs.]

The author discusses the problems of the apparent existence of non-pathogenic strains of *Entamoeba histolytica*, the variations in virulence between strains, and the lack of definite data on the subject of immunity to amoebiasis. The description

of a non-pathogenic species by BRUMPT, *E. dispar*, is discussed, and also the conflicting evidence which has been produced as to the effect of repeated animal passage on virulence. It is considered that the evidence is sufficient to demonstrate that there exist certain strains of *E. histolytica* which are naturally more virulent than other strains, but that up to the present time no strain of this organism has been demonstrated to be non-pathogenic. It is also believed that the virulence of certain strains can be raised by continuous passage through kittens or dogs.

With regard to immunity, the author considers it a fact that some individuals recover spontaneously, and that it is also evident that specific complement-fixing bodies occur in the blood of animals and individuals infected with *E. histolytica*. It seems reasonable to conclude that these bodies indicate a reaction which in all probability leads to more or less immunity in the infected animal.—U. F. R.

GALLI-VALERIO, B. (1935). Sur une amibe de la chèvre domestique. [**Amoebae in the Goat**].—*Schweiz. Arch. Tierheilk.* **77.** 644-645. [1 ref.] [In French].

In examining the faeces of a goat in France, the author encountered numerous amoebic cysts. Rare vegetative elements were present, about $12 \times 9\mu$ in size, exhibiting little differentiation between endoplasm and ectoplasm and with an indistinct nucleus. The cysts varied between 6 and 9μ in diameter and when ripe contained eight nuclei. It is considered that the organism is probably a variety of *Entamoeba coli*, and is non-pathogenic for the goat.—U. F. RICHARDSON.

HOARE, C. A. (1936). **Morphological and Taxonomic Studies on Mammalian Trypanosomes. I. The Method of Reproduction in its Bearing upon Classification, with Special Reference to the *Lewisi* Group.**—*Parasitology.* **28.** 98-109. 1 fig., 2 tables. [18 refs.]

Criticizing DIAS' proposal that the Trypanosomidae of vertebrates should be divided into one group which includes *Leishmania* and *Schizotrypanum* and another group consisting of the genus *Trypanosoma*, Hoare states that the characteristic method of multiplication by division in the leishmania stage in the internal organs, which is said to distinguish the species *Schizotrypanum cruzi*, has in fact been recorded in *T. brucei*, *T. rhodesiense* and *T. gambiense* and in other trypanosomes and, although such a method of multiplication may not be of general occurrence, it is sufficient to indicate that invasion of " fixed " tissue and multiplication in the leishmanial stage are not limited to *S. cruzi*. On the other hand, binary fission of the trypanosome forms of *S. cruzi* in the blood, the absence of which in this trypanosome was advanced as a differential diagnostic character, occurs more commonly than has been previously assumed. Turning to the general subject of the development of trypanosomes, it is pointed out that the method of multiplication of *T. rabinowitschi* and *T. lewisi* is very similar to that described for *S. cruzi*. In the case of *T. lewisi*, multiplication occurs for a restricted period in the blood of the host, the flagellate first assuming the crithidial form. Multiple fission also occurs. The trypanosome forms are capable of dividing by equal binary fission, but these stages are rarely encountered.

The remaining mammalian trypanosomes, belonging to the *evansi*, *vivax*, *congolense* and *brucei* groups, multiply by equal binary fission of the trypanosome stage over an unrestricted period. In view of these facts, the author considers that there is no doubt that *S. cruzi* and *S. pipistrelli*, which DIAS includes in the genus *Schizotrypanum*, belong to the *lewisi* group of the genus *Trypanosoma*.

The paper concludes with a table of the classification of mammalian trypanosomes in which these organisms are divided into a section A, which is composed of members of the *lewisi* group, and a section B which contains the pathogenic trypanosomes.

The method of reproduction is used as a means of differentiating the species included under section A.—U. F. RICHARDSON.

FRENCH, M. H., & HORNBY, H. E. (1935). **Tanganyika Territory. Studies Concerning the Effect of the Plane of Nutrition on the Course of Animal Trypanosomiases. 1.—Introduction, and 2.**—*T. congolense* **Disease from Infection to Crisis.**—*Rep. Dep. vet. Sci. Tanganyika, 1934.* pp. 40-58. 11 figs., 10 tables.

In East Africa three trypanosomes stand out from the rest in respect of their veterinary importance – *T. congolense*, *T. vivax* and *T. brucei*. Distinctions must be drawn between the diseases due to the three species, and it is probable that with regard to *T. brucei* it is advisable to distinguish between the forms of the same disease produced in different species of hosts. With regard to *T. congolense*, however, one may generalize with greater safety as the form of disease set up in all mammalian hosts appears to be essentially an anaemia due to the presence of the trypanosomes in the blood. It is contended that *T. congolense* is so essentially a blood parasite that all the damage to the host originates from parasites in the circulation – which is quite different from what occurs in many infections due to the other trypanosomes.

The first study concerned nine oxen and two sheep inoculated with *T. congolense* and maintained on standard diets until the disease reached the crisis of impending death or commencement of recovery. Owing to the extensive resources of Mpwapwa for this kind of investigation, it was possible to select animals known to be free from complicating infections, so that except in one case (where *Theileria mutans* increased unusually) all the animals developed an uncomplicated trypanosomiasis. The general plan of the experiment was to get animals accustomed to different planes of nutrition and then to study the different reactions to infection as typified by changes in appetite, weight, red cell count and body temperature. Two strains of *T. congolense* were used, but as one of these was so mild that it merely set up a transient infection in the two oxen into which it was inoculated, it is better to judge results from the effects of a very virulent strain inoculated into the remaining seven oxen and two sheep. The results are clear-cut in that on the whole the reactions of the three oxen and the one sheep which received a bare maintenance ration were, if anything, less severe than the reactions of the four oxen and one sheep which received better rations. It is almost certain that the development of infection is not inhibited in any way by good feeding.

An interesting side-line of the main experiment was the demonstration that *T. congolense* infection does not reduce powers of digestion, so that none of the anaemia and loss of weight can be attributed to impaired digestion.—S. A. EVANS.

DONATIEN, A., & LESTOQUARD, F. (1936). Leishmanioses animales. Pathogénie, pathologie, traitement. [**The Pathogenesis, Pathology and Treatment of Animal Leishmaniasis**].—*Rev. Path. comp.* **36.** 77-102. [19 refs.]

In this interesting article, the authors review the subject of animal leishmaniasis. They divide the disease into two types, cutaneous leishmaniasis and visceral or general leishmaniasis. The cutaneous form due to *Leishmania tropica* has been recorded in the dog, cat, jackal, horse and bear. It attacks those parts of the epidermis which are devoid of hair, causing ulcers which heal spontaneously in three to four months. Infected animals do not exhibit any general symptoms of disease.

The visceral form, due to *L. donovani*, has been recorded in the goat, horse, cat and dog, but the authors consider that the evidence of infection in goats and

horses is open to doubt, as the parasites described may have been developmental forms of trypanosomes.

A very full account is given of the symptoms, pathology and epizootiology of visceral leishmaniasis of the dog, and methods of diagnosis, prophylaxis and treatment are fully discussed. It is stressed that the disease in dogs takes a very variable course. Whilst some animals may be heavily infected, they may yet exhibit no symptoms at all. Others develop acute disease leading rapidly to death, whilst others linger for months and years ; there is some evidence that others may make a spontaneous recovery.

The main symptoms attracting attention are skin ulceration, furfuraceous eczema, lethargy and debility, but in an enzootic area any dog exhibiting symptoms of debility should be suspected of leishmanial infection.

The main pathological lesions depend upon the taking up of the parasites by phagocytic histocytes and the surrounding of these parasitized histocytes with monoblasts, the process leading to the blockage of blood vessels and, in the case of cutaneous lesions, to skin necrosis and ulceration.

The principal lesions are hypertrophy and congestion of the spleen, lymphatic glands and liver, congestion of the bone-marrow, hypertrophy of the reticulo-endothelial tissue of the kidney, and sometimes ulceration of the stomach. Death may be due to uraemia owing to the action of the parasites on the kidneys, or to haemorrhagic enteritis following infection through the stomach.

The general symptoms, confirmed by reactions to the formol-gel or sero-flocculation tests, are considered adequate for a positive diagnosis but, if the test is negative, skin scrapings should be examined for parasites.

Under prophylaxis, the slaughter of affected animals is recommended owing to the difficulty in protecting animals against the attacks of *Phlebotomus*.

Recorded results of treatment with tartar emetic " stibyal " [antimony sodium tartrate], " neostibamine " and " anthiomaline " are discussed, but none of these drugs are considered to have proved really satisfactory.—U. F. Richardson.

Pérard, C. (1936). Au sujet d'un cas de leishmaniose canine généralisée, remarqué à propos du diagnostic. [**A Case of Generalized Canine Leishmaniasis. Notes on Diagnosis**].—*Rev. Path. comp.* **36.** 110-116. 2 figs. [1 ref.]

The author records observations on an experimental case of canine leishmaniasis six months after inoculation. Parasites could be detected in the spleen and throughout the skin except for the ulcers of the ears and limbs. Material from the lymph glands proved negative both to microscopic and cultural examination. The serum gave positive reactions to both the formol-gel and " sulfarsenol " tests. It was also noted that the animal developed almost complete cutaneous anaesthesia.
—U. F. Richardson.

Faure-Brac. (1936). La lésion cutanée dans la leishmaniose canine représente-t-elle la porte d'entrée ? [**Does the Skin Lesion in Canine Leishmaniasis represent the Point of Entry of Infection ?**]—*Rev. Path. comp.* **36.** 103-104. [2 refs.]

The author argues that the skin lesions probably do not represent the initial leishmanial lesions as they are not confined to one area but scattered over the skin, some of them being situated where ticks or other insects rarely attack. After antimonial treatment of infected dogs, there is often a revivifying of the skin lesions, which may be due to the fact that they represent the route of exit for the parasite rather than the route of entry.—U. F. Richardson.

GIRAUD, P., CIAUDO, P., & BERNARD, R. (1935). Sur la date d'apparition des réactions sérologiques dans la leishmaniose canine expérimentale. [**The Time of the Appearance of Serological Reactions in Experimental Canine Leishmaniasis**].—*C. R. Soc. Biol. Paris.* **120.** 1250-1256. [2 refs.]

After the experimental infection of two dogs with spleen pulp from a dog infected with leishmaniasis, the serological reactions (formol-gel, " ureastibamine ", " sulfarsenol " and iron peptonate tests) remained negative in one case for three months, and in the other case for six months. The total serum proteins and the ratio of albumin to globulin showed an increase during the early stages of infection, but returned to normal at the end of six months, and finally showed a marked decrease. The formol-gel, " ureastibamine " and iron peptonate tests proved reliable, but the reaction to " sulfarsenol " was very irregular.—U. F. RICHARDSON.

LESTOQUARD, F., & DONATIEN. (1936). Un cas autochtone de leishmaniose générale du chien à Toulouse. [**An Autogenous Case of Canine Leishmaniasis at Toulouse**].—*Bull. Soc. Path. exot.* **28.** 921-922.

The authors record the detection of a general leishmania infection in a dog which had been born in Toulouse and had never left that town.—U. F. RICHARDSON.

DE PAOLIS, E. (1935). La leishmaniosi delle pecore. Nota preliminare. [**A Preliminary Note on Leishmaniasis of Sheep**].—*Clin. vet., Milano.* **58.** 188-191. 3 plates. [5 refs.]

The author records that, in investigating an outbreak of braxy in sheep in Andria, Italy, he encountered parasites resembling *Leishmania donovani* and *L. infantum* in the blood and all the organs, particularly the spleen and bone-marrow, of affected animals. The actual effect of infection was obscured by the intercurrent disease, but a mortality of 30 to 35 per cent. occurred in the affected flocks. The parasites are described as round or oval, measuring 3 to 4μ in diameter with a spherical or semilunar nucleus and a blepharoplast. Cultures made in Nicolle's medium from spleen or marrow juice exhibited a development of flagellates in the water of condensation. The importance of sheep as a possible reservoir for the virus of canine and human leishmaniasis is stressed and the prevalence of leishmaniasis in sporting dogs and sheep dogs is noted as evidence of the connexion between the infection of dogs and sheep. [Neither the description of parasites nor the plates give any indication that it possessed the typical rod-shaped kinetoplast of leishmanial parasites, whilst the appearance of flagellates in the cultures might indicate an infection with *Tryp. melophagium*].—U. F. R.

VERGE, J. (1936). Biologie des leishmanias. [**The Biology of Leishmania**].—*Rev. Path. comp.* **36.** 58-76. 3 figs.

This article is a good review of the literature on the subject of leishmania, discussing both the parasites of human beings and animals, and their relationship to each other. It contains information obtained from all recent investigations and, as the author remarks, does not attempt to conceal the lack of knowledge which still exists about these parasites.—U. F. RICHARDSON.

HEITGREK, W. (1935). Beitrag zur Verbreitung und Bekämpfung der Trichomonadenseuche des Rindes. [**Spread and Control of Trichomonas Infection of Cattle**].—*Inaug. Diss., Giessen.* pp. 31. [Numerous refs.]

A record of investigations into bovine trichomoniasis in five districts near Giessen. Good results in the control of the disease were obtained by the usual

method of temporary suspension of service to allow of a separation of healthy and infected cattle, and the obtaining of new healthy bulls.

Cows infected with vaginitis were treated by irrigation with normal saline followed by the use of alum solution ; endometritis and pyometra were treated by saline irrigation, uterine massage *per rectum*, and the intra-uterine injection of Lugol's iodine solution. Cases of pyometra showing uterine atony were treated by the administration of "lentin" and the expression of the corpus luteum. After recovery from clinical symptoms the animal should be kept from service for eight to ten weeks.

The treatment of bulls was not very satisfactory, and apparently recovered animals should not be used for general breeding unless a test service on a healthy heifer gives negative evidence of freedom from disease.—U. F. RICHARDSON.

BOURDIÉ. (1936). Les trichomonas : leur rôle dans l'avortement précoce, le pyomètre et la stérilité de la vache. [**Abortion, Pyometra and Sterility in Cattle caused by Trichomonads**].—*Rec. Méd. vét.* **112.** 93-100. 2 figs. [Numerous refs.]

The author records investigations carried out to ascertain whether *Trichomonas foetus* existed in France. Out of 27 cases of pyometra encountered at an abattoir, nine cases showed a trichomonad infection, whilst no healthy uteri contained trichomonads. It is noted that in trichomonad pyometra there is no thickening of the mucous membrane of the bladder. The pus is very fluid and contains floccules which settle to the bottom on standing. The organism encountered is described, but cultivation was not successful, as it proved impossible to obtain the organism in a state of purity.—U. F. RICHARDSON.

VERGE, J. (1935). Les spirochétoses du chien. [**Spirochaetosis of Dogs**].—*Rev. gén. Méd. vét.* **44.** 705-711.

This article briefly reviews the spirochaetal infections of dogs. *Spirochaeta canina*, which measures from 8 to 22μ long by 0·3μ broad, is said to cause a disease of dogs characterized by debility and loss of appetite. It causes anaemia associated with anisocytosis and polychromatophilia.

Sp. meloenogenes canis, a fine spirochaete measuring up to 25μ in length, is associated with Stuttgart disease of dogs, being found in the kidneys and sometimes in other organs of affected animals. Agglutination and lytic reactions, as well as the response of the canine disease to antileptospiral serum, indicate a close relationship between this organism and *Leptospira ictero-haemorrhagiae* of man.

Enzootic jaundice of dogs is associated with a spirochaetal infection of the liver and kidneys with an organism closely related to *L. ictero-haemorrhagiae*, known as *L. ictero-uraemia canis* or *L. canicola*.

Finally, a form of ulcerative gingivitis in young dogs, associated with a mixed infection with various species of *Treponema*, has been described by several authors.
—U. F. RICHARDSON.

KARUNARATNE, W. A. E. (1936). **The Pathology of Rhinosporidiosis.**—*J. Path. Bact.* **42.** 193-202. 26 figs. on 7 plates. [Numerous refs.]

This article gives an account of the structure and life-history of *Rhinosporidium*, its morbid anatomy, histology, and the clinical manifestations which it produces in man. The disease almost invariably occurs in males and has been reported from India, Ceylon and North and South America. It has not proved possible to transmit the disease to the lower animals, but cases have been reported in mules and horses in South Africa and South America, and one in a bullock in India.

Details of the morphology and method of reproduction of the parasite are given.
—U. F. RICHARDSON.

DISEASES CAUSED BY VIRUSES.

LEDINGHAM, J. C. G. (1935). **The Comparative Study of Clinically Allied Viruses : Some Unsolved Problems of Edward Jenner.**—*Proc. R. Soc. Med.* **29.** 73-82. [6 refs.] [Also appeared, with author's addendum, in *Vet. Rec.* **16.** 6-13].

The major portion of this article comprises a detailed history of cow pox in its relation to other members of the variola-vaccinia group. In the course of the argument, the question is discussed as to whether cow pox and horse pox are diseases *sui generis* or whether they have their origin in the variolation or vaccination of these species from man ; the opinion is expressed that the former view is probably correct. The experiments of CEELY in 1840, on the difficulty in tracing any connexion between smallpox and outbreaks of cow pox, are quoted in support of this contention, and it is also pointed out that, of recent years, in Holland and in Austria, it has not been possible to find any history of the development of cow pox in cows as a result of recent vaccinations in man. In addition, under experimental conditions, variolation of the cow or calf, although possible, is extremely difficult.

Ledingham then cites his own experiments and those of his colleagues on the transmission of variola to the rabbit and monkey. Mention is also made of the relationship between fowl pox and vaccinia, the opinion being expressed that they are not connected.—R. E. GLOVER.

SCHMIDT, W. (1935). Vergleichende Untersuchungen zur Pathologie pneumotroper Virusarten. [**Comparison of the Pathology of Pneumotropic Viruses**]. —*Arch. wiss. prakt. Tierheilk.* **70.** 1-22. 11 figs. [Numerous refs.]

In recent years a number of diseases affecting the respiratory organs of animals have been described, the causal agent being in each case a filtrable virus. These diseases include swine influenza (in America), " Ferkelgrippe ", and infectious bronchitis in horses (Hoppegarten cough) and cattle. All these diseases show several common features, such as the pneumotropic character of the virus, similar localization of the lesions and association with certain specific bacteria. Such resemblances led WALDMANN to group the causal agents under the term " pneumotropic viruses ".

This paper is a comprehensive review of the literature relating to each of these diseases, together with an account of the results of the experiments and observations of the author.

Swine influenza is an epizootic disease of adult pigs, due primarily to a filtrable virus which is often associated with the " swine influenza bacillus ". The lesions that develop are localized in the lung and consist of a bronchitis, peribronchitis, atelectasis and broncho-pneumonia. The primary reaction to the virus appears to be a peribronchial infiltration.

" Ferkelgrippe " is enzootic in character and affects young pigs. The typical lesions are identical with those of swine influenza but the presence of the " swine influenza bacillus " is necessary for their production. The virus alone produces only a peribronchial infiltration.

Equine infectious bronchitis (Hoppegarten cough) is an extremely infectious disease due to a filtrable virus and characterized by a bronchitis and peribronchitis.

When the affected animal is allowed to continue at work, or the hygiene is defective, haemolytic streptococci complicate the picture with the production of a bronchopneumonia.

Infectious bovine bronchitis, although not definitely proven to be due to a virus, is believed by the author to be identical with the condition experimentally produced in calves and adult cattle by the intranasal inoculation of material from cases of epidemic equine cough [this *Bull.* **5.** 490].

The results of attempts at experimental transmission of the diseases to laboratory animals and to animals of a species different from that naturally affected show further points of similarity.

In all four types of disease the filtrable virus produces a similar, and to a certain extent characteristic, reaction – a peribronchial infiltration of lymphocytes and mononuclear wandering cells. The end-result of a pure virus infection is almost invariably complete resolution. The virus disease may in each case be complicated by the effects of bacteria, the lesions of the double or secondary infection being similar in each case.

It is considered that these points of similarity justify the use of the term " pneumotropic viruses " as applied to the causal agents of this group of respiratory diseases.—E. G. White.

I. Traum, J. (1935). **Foot-and-Mouth Disease : Specific Treatment, Eradication, and Differential Diagnosis.**—*12th Int. vet. Congr. 1934.* **2.** 87-101. [Numerous refs.] [French, German and Spanish summaries].

II. Flückiger, G. (1935). La lutte moderne contre la fièvre aphteuse. **[Control of Foot and Mouth Disease in Switzerland].**—*Ibid.* 101-111. 2 figs., 1 chart. [English, German and Spanish summaries : abst. from orig. in French].

III. —. (1935). **Discussion of Papers on Foot-and-Mouth Disease.**—*Ibid.* 111-115.

I. In countries where the slaughter policy for controlling foot and mouth disease is applied it is imperative that diagnosis should be certain and made without delay. Hitherto, the only disease which presented any difficulty in differential diagnosis was vesicular stomatitis when it appeared in cattle. Although the disease is also communicable experimentally to pigs, no outbreaks in swine have as yet been reported.

In 1932 and 1933, in California, there appeared in garbage-fed pigs a vesicular exanthema of virus origin which was clinically indistinguishable from foot and mouth disease and from experimental vesicular stomatitis. The virus was also immunologically distinct from the viruses of these diseases and, although slightly pathogenic for horses, failed to infect cattle or guinea pigs.

In discussing the new position from the standpoint of differential diagnosis, the author points out the limitations of cross-immunity tests and refers to the lack of pathogenicity of the foot and mouth disease virus for species ordinarily susceptible, following adaptation of the virus for a particular species.

It is also stated that equine encephalomyelitis virus in guinea pig tissue has given rise to vesicular lesions on the tongues of injected horses.

II. Flückiger states that the chief source of distribution of the virus of foot and mouth disease is the permanent carrier and points out that experience, observation and scientific experiments all show that some recovered animals will harbour the virus indefinitely.

So long as preventive methods are not effective, the only efficient method of eradication is the slaughtering of affected animals. The larger the areas in which this policy is adopted the more effective it is, and the author states that if this

policy were only adopted by all governments in entire continents there would be some hope of complete eradication.

III. WALDMANN and DAUBNEY contributed to the discussion on these papers. DAUBNEY expressed the view that we were coming to the stage of regarding the virus of foot and mouth disease in cattle as an extremely labile virus liable to mutations or changes which might completely alter the antigenic properties of any given strain.—GWILYM O. DAVIES.

SCHMALTZ. (1936). Der Zug der Maul- und Klauenseuche 1935. **[Foot and Mouth Disease in Germany in 1935]**.—*Berl. tierärztl. Wschr.* **52.** 56-57.

This is a digest of the figures published in the *Berl. tierärztl. Wschr.* from time to time concerning the incidence of foot and mouth disease in Germany from 1908 to the present time.

Attention is first drawn to the well-known wave-like incidence of the disease ; its distribution throughout the different provinces of Germany during the years 1933, 1934 and 1935 is then discussed. The freedom of East Prussia from the disease since 1932 is noteworthy.—N. S. BARRON.

GALEA, M. (1935). Études sur la réaction de fixation du complément dans la fièvre aphteuse. **[Complement-Fixation in Foot and Mouth Disease]**.—*Arch. roum. Path. exp. Microbiol.* **8.** 87-98. 2 tables. [8 refs.] [In French].

The author confirmed the value of the complement-fixation test, as elaborated by CIUCA [(1929). *J. Hyg., Camb.* **28.** 325.], for the diagnosis of foot and mouth disease. Successful results were obtainable only by the use of living virus, the macerated pad suspension suggested by CIUCA proving unsatisfactory. The most potent antigens were prepared by grinding the contents of 24-hour vesicles in normal saline solution and adding to the suspension an aqueous extract of guinea pig brain. The latter, by stabilizing the antigen, much improved its keeping qualities : for example, at temperatures of –6° to –8°C., it remained potent for at least 137 days.

The sera examined were obtained from recovered, vaccinated or hyper-immunized guinea pigs, and they were inactivated at 55°C. for 30 minutes. Higher temperatures were markedly detrimental to the antibody content of the sera. In conducting the tests, increasing amounts of complement were added to fixed amounts of serum and antigen. The reactions were strictly specific for the " O ", " A " and " C " types of virus respectively.—R. E. GLOVER.

HOMUTOV, P. (1935). L'action du formol sur le virus aphteux O Vallée en milieu aqueux et en présence du chloroforme (pH 7,6). **[The Action of Formol on the Virus of Foot and Mouth Disease (Vallée O) in Aqueous Solutions with and without Chloroform]**.—*Bull. Acad. vét. Fr.* **8.** 492-497. 2 tables. [1 ref.]

HOMUTOV, P. (1935). L'action du formol sur le virus aphteux O Vallée dans un milieu glycériné (pH 7,6). **[Action of Formol on the Virus of Foot and Mouth Disease in Glycerinated Solutions]**.—*Ibid.* 498-501. 2 tables.

Many workers who have used formalinized foot and mouth disease virus as an immunizing agent have noted the sudden fall in antigenic value which occurs soon after the virus has become inert. The preliminary experiments described in these articles were undertaken with the object of improving the keeping qualities of formol vaccines.

It was found that, when suspended in a buffered solution containing chloroform, the O strain (guinea pig) retained its virulence for long periods, *e.g.*, 105

days at +2°C. In addition, in the presence of chloroform the inactivating action of formalin was considerably delayed, but the debasement in the antigenic value of the inert suspensions was as rapid as was the case with aqueous suspensions.

The results obtained with glycerin, however, were more encouraging. For example, at a temperature of 20°C. formalin in a dilution of 1 : 1,000, in a buffered glycerin solution, inactivated the virus at about the 17th day, but the suspension retained its antigenic value for 79 days.—R. E. GLOVER.

GORET, P., SANDOR, G., & DOMERCQ, J. (1935). Étude comparative du système lipo-protéidique du sérum des chevaux atteints d'anémie infectieuse, des chevaux normaux, des chevaux fiévreux et hyperimmunisés. **[The Lipoid-Protein Content of the Blood Serum of Horses affected with Infectious Anaemia, and of Normal, Fevered and Hyperimmunized Horses].**—*Bull. Acad. vét. Fr.* **8.** 517-521. 4 tables, 1 chart. [3 refs.]

The authors describe the results obtained in their further studies of changes in the colloids of the sera of horses affected with equine infectious anaemia. [For abstract of authors' previous article see this *Bull.* **5.** 269]. A modified technique produced somewhat different results from those previously recorded. Tests were also carried out with the sera of normal horses, fevered horses and horses hyperimmunized with large doses of tetanus anatoxin. The results obtained in cases of equine infectious anaemia always differed from the others, particularly in regard to the small quantity of fat extractable. Beyond establishing the difference in the constitution of the lipoid-protein system of healthy and diseased horses, the authors find these results of no immediate practical value or diagnostic merit. —C. DAVENPORT.

MROWKA, F. (1935). Ueber Veränderungen an den roten Blutkörperchen gesunder Pferde nach künstlicher Infektion mit infektiöser Anämie. **[Changes in the Red Blood Corpuscles of the Horse after Artificial Infection with Infectious Anaemia].**—*Arch. wiss. prakt. Tierheilk.* **69.** 446-452. 9 figs. [2 refs.]

Continuing his investigations as to the diagnostic value of the changes in the blood corpuscles encountered in horses affected with infectious anaemia and also in some apparently healthy horses [this *Bull.* **6.** 174.], the author inoculated two horses, showing a normal blood picture, with blood from two apparently healthy horses whose blood exhibited changes indicative of disease. Both the experimental animals developed changes similar to those from which the inoculum was obtained but only one of them developed a severe febrile reaction and visible symptoms. When the blood picture in the latter animal had returned to normal, it was reinoculated with blood from the other inoculated one, and again developed a mild reaction. On slaughter, both animals exhibited lesions considered to be pathognomic of infectious anaemia.

In these investigations large blood corpuscles were encountered periodically in the blood of both experimental horses. These corpuscles were characterized by a pale blue colouration of the areas which take the dye by the author's moist staining method. Numerous shining red granules were often present in these cells, and the stainable area of the cell was considerably greater than that of normal corpuscles. The author designates these corpuscles " blue cells ".—U. F. R.

I. REMLINGER, P., & BAILLY, J. (1935). Modes de transmission du virus de l'encéphalomyélite des équidés en Argentine. **[Modes of Transmission of Argentine Equine Encephalomyelitis].**—*C. R. Soc. Biol. Paris.* **120.** 983-985.

II. Remlinger, P., & Bailly, J. (1936). Transmission de l'encéphalomyélite argentine des équidés à l'oie, au canard, à la buse et au merle. [**Transmission of Argentine Equine Encephalomyelitis to Goose, Duck, Hawk and Blackbird**].—*Ibid.* **121.** 146-149.

III. Remlinger, P., & Bailly, J. (1936). Siège du virus dans l'encéphalomyélite argentine des équidés (maladie expérimentale). [**Distribution in the Body of the Virus of Argentine Equine Encephalomyelitis**].—*Ibid.* 429-431. [1 ref.]

I. While intracerebral or subdural inoculation is the method of choice, more frequently than not infection follows introduction of virus by a great variety of peripheral routes. Of some interest is transmission by corneal scarification, and (in one guinea pig) by allowing infective material to dry on the shaved but otherwise uninjured skin. Feeding experiments were positive in a donkey, and in a proportion of rats and guinea pigs – in the case of one guinea pig virulent emulsion was introduced directly into the stomach – but not in the cat or hedgehog.

II. The disease is transmissible by subdural inoculation to all birds mentioned above (*Anser cinereus*, *Anas boschas*, *Circus rufus*, *Turdus merula*), and by intraperitoneal inoculation to the blackbird ; the domestic fowl apparently is insusceptible. As in mammals, the symptoms, described in detail, are partly of excitation and partly of paralysis, but they do not always end fatally. Ducks do not always show symptoms and in fatal cases the brain may or may not have undergone " autosterilization ". In the case of the blackbird also, the brain at death may be avirulent.

III. In the dog and rabbit, all parts of the central nervous system are more or less equally virulent, in the latter the main nerve trunks nearly always. In the guinea pig, rabbit, rat and donkey, the blood is nearly always avirulent during the period of nervous symptoms ; positive results were obtained in one horse and one guinea pig. At the same period the liver, spleen and kidney are avirulent, the parotid and suprarenal glands almost always virulent.—E. Weston Hurst.

Paschen, E. (1936). Züchtung des Ektromelievirus auf der Chorion-Allantois-Membran von Hühnerembryonen. [**Cultivation of Virus of Ectromelia on Chorio-Allantoic Membrane of Chick Embryo**].—*Zlb. Bakt. I. (Orig.).* **135.** 445-452. 2 figs. [18 refs.]

Beginning with elementary bodies from infected liver, the author cultivated the virus of infectious ectromelia for 18 passages in the chorio-allantoic membrane of developing hens' eggs. With increase of virulence, in the later passages, the embryo was invariably killed. Material at the tenth passage was pathogenic for the rabbit cornea, and from the cornea the skin of the rabbit could be infected. The pads and corneae of guinea pigs were infected with culture at the 12th passage. Neither animal has yet been shown susceptible to mouse virus (though in a footnote Paschen states that he has since infected the rabbit cornea with mouse virus). Elementary bodies and inclusion bodies were abundant in cultures and lesions. Inclusion bodies arise primarily from clumping, within the cytoplasm of infected epithelial cells, of the freely multiplying elementary bodies, though reaction products of the cell may conceivably contribute to their formation.—E. W. Hurst.

Urbain, A., & Bullier, P. (1935). Le typhus des carnassiers de ménagerie. La transmission spontanée aux ours. Essais de vaccination. [**A Virus Disease of Captive Carnivora. Transmission to the Bear. Attempts at Vaccination**].—*Bull. Soc. Path. exot.* **28.** 909-912. [5 refs.]

The disease described occurred in captive carnivora, attacking lions, leopards, hyenas, panthers and several other species of wild cats. The disease, which is due to a filtrable virus distinct from that of cat distemper, is very contagious and is characterized by fever and diarrhoea, the faeces being green or yellow. The intestines are congested, the stomach ulcerated and there is also congestion of the liver, spleen and kidneys.

The present article records the death of nine bears from this disease, and the success obtained by vaccinating any newly introduced carnivora or bears with a formolized vaccine made from the spleen of an animal that had died from the disease.

—U. F. RICHARDSON.

I. BURNET, F. M. (1935). **Influenza Virus Isolated from an Australian Epidemic.**—*Med. J. Aust.* Nov. 9th. 651-653. 1 fig., 1 table. [5 refs.]

II. BURNET, F. M. (1935). **Propagation of the Virus of Epidemic Influenza on the Developing Egg.**—*Ibid.* Nov. 16th. 687-689. 1 fig., 1 table. [2 refs.]

I. Burnet succeeded in isolating a virus from an outbreak of human influenza which occurred in Melbourne. Filtrates set up the disease in ferrets and it was kept going by serial passage in these animals. Antiserum neutralization experiments showed this strain to be serologically similar to those isolated in England and America.

II. Hitherto, the only method of propagating the influenza virus has been by animal passage. Burnet has now succeeded in cultivating it on the chorio-allantoic membrane of the developing egg. After 14 passages it retained virulence for ferrets and mice. The lesions produced in the chorio-allantoic membrane are described. It is suggested that these " cultures " may be useful in providing antigen for immunization purposes.—W. I. B. BEVERIDGE.

I. EDWARDS, J. T. (1936). **Experiments on the Transmission of Human Cold to Hedgehogs : A Preliminary Note.**—*Proc. R. Soc. Med.* **29.** 393-404. 12 figs., 7 tables. [6 refs.]

II. —. (1935). **Hedgehogs and the Common Cold.**—*Lancet.* **229.** 1307-1308.

I. The author regards his results as suggestive, but not conclusive, evidence that acute human coryza may be caused by a filtrable virus. Three specimens, filtered or unfiltered, of human nasal discharge (one bacteria-free), taken at an early stage and inoculated intranasally into hedgehogs, set up a catarrhal condition not seen after inoculation of broth or other inert fluid, and yielding bacteria not present in the inoculum. A few experiments with ferrets, mice, rabbits and guinea pigs were negative.

The experiments were suggested by the earlier observation that, in foot and mouth disease of the hedgehog, the virus lesion favoured development of catarrhal changes associated with a varied bacterial flora, and particularly with *Brucella bronchiseptica.*

In the hedgehog, foot and mouth disease spreads by contact ; virus is present in the exhalations in quantity unrelated to its concentration in the blood, and originates presumably from local lesions of the respiratory mucosa.

II. An annotation of the preceding paper and discussion. STUART-HARRIS hesitates to conclude that the effect described above is a specific one, since normal hedgehogs vary greatly in the amount of their nasal secretion which can be increased by *Br. bronchiseptica* alone, and he has failed to correlate the amount of nasal discharge with the histological findings.—E. WESTON HURST.

PARASITES IN RELATION TO DISEASE (ARTHROPODS).

KNOWLTON, G. F., & MADSEN, D. E. (1935). **Mosquitoes annoy Sheep.**—*J. econ. Ent.* **28.** 834-835.

Sheep on certain pastures in Rich county, Utah, were attacked by mosquitoes (*Aedes dorsalis*, *A. idahoensis* and *A. iminatus*) which were present in enormous numbers all over the district. Attacked sheep bit themselves to relieve the irritation, causing sores : they also congregated and charged around in bunches in the open ground in the endeavour to avoid the mosquitoes.—J. E.

KINGSCOTE, A. A. (1936). **On the Prevalence and Prevention of Myiasis Caused by the Grey Flesh Fly (Wohlfahrtia Vigil, Walker).**—*N. Amer. Vet.* **17.** No. 2. 15-17.

In the north-east and north-central states, and in southern Canada, this fly is responsible in summer for numerous cases of myiasis, often fatal, among young mink, foxes, puppies, kittens and such animals. Children under one year old are also attacked. The larva is laid on the unbroken skin, and burrows into the subcutaneous tissue, a boil-like lesion resulting. Provision of fly-screening for pens, and regular removal of larvae, are recommended for fur farms.—J. MACLEOD.

I. SCHWERDT. (1936). Die Bekämpfung der Dasselfliege im Reich 1935. **[Control of Warble Flies in Germany in 1935].**—*Berl. tierärztl. Wschr.* **52.** 89-92. [1 ref.]

II. BARTELS, & CLAASSEN, P. (1936). Die Durchführung des Dasselgesetzes im Regierungsbezirk Schleswig 1935. **[Control of Warble Flies in Schleswig, 1935].**—*Ibid.* 1-4. [1 ref.] [For abst. of previous progress reports see this *Bull.* **5.** 501 and 727].

I. The following territorial reports for 1935 are given :–

PRUSSIA.—The incidence of the fly varies considerably in different districts and further measures for preventing its spread are of first importance : seven recommendations are given.

SCHLESWIG.—See II.

BAVARIA.—Great progress in eradication is reported.

OLDENBURG.—About 60 per cent. of 210,000 head of cattle are considered to be affected. Slight progress is reported. The importance of the second treatment in June is stressed.

Derris was nearly exclusively used in 1935. Its various commercial forms used in Germany are discussed in relation to their content of active principle. A few notes are also given on sources of error and failure in warble larvicide campaigns and on warble anaphylaxis, together with detailed recommendations for the 1936 campaign.

II. The practical working of the campaign in Schleswig in 1935 is described. The incidence of the fly is restricted and the true result of derris treatment is in doubt. The article is of particular interest from the point of view of administration.—J. E.

DA GRANA, A. (1935). La zona de Henry y el diagnóstico microscópico de la sarna sarcóptica del perro. **[The Microscopic Diagnosis of Sarcoptic Mange in the Dog].**—*Rev. zootéc.* **22.** 88-93. 1 fig.

The author discusses the value of the method of diagnosis described by HENRY and LEBLOIS [LEBLOIS. (1926). " Documents pour servir à l'édification d'une dermatologie animale (chien et chat)." Paris : Vigot Frères. p. 54.] who

claimed that an abundance of sarcoptes could be discovered in cases of sarcoptic mange in the dog by taking scrapings in the pouch present in the lower third of the posterior edge of the external ear [referred to as the zone of Henry]. The area is prepared by moistening with lactophenol.

Twelve cases are recorded and in these it was possible to demonstrate sarcoptes when scrapings from the affected areas had yielded negative results. The author agrees that the technique has distinct advantages, but is unable to endorse Henry's statement that the parasites are present in great abundance. The method is of greatest value in diagnosing sarcoptic mange in young dogs in which, owing to the diffuse nature of the lesion, it is difficult to find a suitable site from which to take scrapings, and also in cases of mange which have been subjected to ineffectual treatment. In the former case, the securing of a diagnosis is of particular value on account of the difficulty of distinguishing between mange and non-specific desquamation.—R. S. Roberts.

PARASITES IN RELATION TO DISEASE (HELMINTHS).

Balozet, L. (1936). Sur un *Brachylaemus* de l'intestin du porc. **[Brachylaemus in the Intestine of Pigs]**.—*Bull. Acad. vét. Fr.* **9.** 93-99. 6 figs.

Balozet gives an account of a heavy infestation of pigs with a distome of the genus *Brachylaemus* Dujardin 1845 (*Haemostomum* Braun 1899). All the pigs which were examined were found to be carrying a very heavy infestation in the terminal part of the small intestine, each sq. cm. of mucous membrane containing " several dozens " of the parasites. As swine plague was present in the herd of pigs, it was not possible to make any observations on the pathogenicity of the parasitic infestation. A description of the parasite is given and the new name *B. suis* is proposed for facility of reference although the morphology of the parasite closely resembles that of *B. erinacei* Blanchard 1847, with which species it may later prove to be identical.—E. L. Taylor.

Burggraaf, H. (1935). Bilharziose bij het rund, op de oostkust van Sumatra. **[Bilharziasis of Cattle in Sumatra]**.—*Tijdschr. Diergeneesk.* **62.** 615-622. 3 text figs., 6 figs. on 1 plate. [3 refs.] [English, French and German summaries : abst. from orig.]

The parasite – *Schistosoma spindale* – lives in the veins of several organs, especially in the liver. Symptoms of infestation include anaemia, diarrhoea and oedema ; death may occur in ten days. *Post-mortem* examination shows the veins of the dark-coloured liver to be obstructed by the parasites. As regards pathological histology, there is endophlebitis of the liver, a general increase in the interstitial connective tissue and necrosis of liver cells. The typically shaped eggs occur in the walls of the veins and the liver tissue. The intestinal wall is also invaded and contains egg nests.—M. J. J. Houthuis (Rotterdam).

Pande, P. G. (1935). **Acute Amphistomiasis of Cattle in Assam : a Preliminary Report.**—*Indian J. vet. Sci.* **5.** 364-375. 3 tables. [3 refs.]

A disease of cattle is described, characterized by oedematous swelling below the jaw, followed by pronounced anorexia, and later by diarrhoea, the faeces being dark in colour, of an offensive odour and containing shreds of mucus. Emaciation then sets in, the animal lies down and refuses to rise and death may follow, the rate of mortality often reaching 30 to 40 per cent. of the affected herd. The disease is particularly acute in calves which may die after an illness lasting only three or four days.

Post-mortem examination was carried out on some 50 cases in which an acute catarrhal condition of the duodenum and ileum was observed and found to be associated with the presence of immature amphistomes embedded in the mucous membrane, and it is concluded that these parasites are the cause of the disease, which probably occurs in many parts of Assam. The larval amphistomes are referable to the genus *Paramphistomum*, but as mature specimens were not present the species could not be determined. [The evidence that the amphistomes are the cause of this condition is by no means conclusive].—E. L. TAYLOR.

CAMPBELL, D. H. (1936). **Active Immunization of Albino Rats with Protein Fractions from** *Taenia taeniaeformis* **and its Larval Form** *Cysticercus fasciolaris*.—*Amer. J. Hyg.* **23.** 104-113. 1 table. [2 refs.]

Primary infection with oncospheres of this tapeworm confers a strong immunity on rats, so that few cysts of *C. fasciolaris* are found in their livers ; but uninfected rats can be experimentally infected with practically any desired number of cysticerci at one dosage.

Oncospheres were obtained by washing and breaking up *T. taeniaeformis* in Ringer's solution. Doses of from 200 to 700 oncospheres introduced into the stomach of rats produced average infections of from 90 to 117 cysts of *C. fasciolaris* in their livers.

Rats were immunized by six intraperitoneal injections, given every other day, except for a rest of four days between the third and fourth injections, of suspensions in normal saline of various extracts of whole tapeworms or their larval stages. The preparation of these extracts is described fully. They are roughly designated as nucleoprotein, globulin, albumin, metaprotein, albuminoid, polysaccharide, saline-soluble, saline-insoluble, etc.

Extracts of either adult or larval whole worm stimulated in rats varying degrees of resistance to infection with *C. fasciolaris*. Whole-worm extracts of fresh worms and those containing globulin, nucleoprotein, albumins and the saline-soluble and saline-insoluble extracts from fresh worms produced a high degree of resistance. Albumins from dried whole worm and metaproteins produced little, if any, protection. Albuminoids and polysaccharide fractions produced a significant degree of resistance.

The total immunity was composed of an early immunity, defined as a reaction preventing larvae from appearing in the liver of immunized rats and a late immunity, defined as the destruction of larvae after they have encysted in the liver. The latter appeared as a natural reaction in the controls.

Nucleoprotein in a neutral extract and albumins from fresh worm material produced relatively high early immunity, but a late immunity less than that shown by the controls. Dilute saline extract and albumins from dried worm material produced practically no early immunity, but a late immunity much greater than that shown by the controls.

Early and late immunity vary independently of each other, the former varying more than the latter. The reason for this has not been found, but it is suggested that chemical and cellular reactions may play different parts in these two types of immunity and that the chemical and physical characteristics of the proteins concerned may determine whether the defensive reaction occurs early or late.—G. L.

MORRISON, W. K. (1936). **Pig and Pork : Cysticercosis** (*Taenia solium*).—*J. R. Army med. Cps.* **66.** 32-35.

Cysticercosis of the pig is not uncommon in South India, both in the native " country " pigs and in imported animals. Meat inspection is very unreliable for

ensuring that the pork is safe for human consumption and all pork should be thoroughly cooked.—E. L. TAYLOR.

DE BOER, E. (1935). Experimenteel onderzoek betreffende *Ascaris lumbricoides* van mensch en varken. [*A. lumbricoides* **in Man and Swine**].—*Tijdschr. Diergeneesk.* **62.** 965-973. [English, French and German summaries: abst. from orig.]

Information is given with regard to (1) the identification of *A. lumbricoides* in man and swine, and (2) the behaviour of the pig in relation to an infestation with the ascaris of swine or man. The complete development of the ascaris of man can take place in pigs, but the interval taken is longer. Pigs can only be infected experimentally with eggs from human or pig *Ascaris* when repeated doses are given. Young pigs therefore possess great vital resistance. The development-cycle, the passage through the liver and the lungs included, is about nine weeks, the stages in which there is development in the lungs and liver occupying about ten days of this period. Resistance to experimental infestation is not diminished by lack of vitamin A. Spontaneous infestation under natural conditions follows when infected material reaches the ground, encounters conditions of sufficient humidity, and is again taken in by the host.

Acquired resistance occurs. Owing to continuous reinfection, all stages of development of the parasite are seen in the intestines of the host, as long as no adult mature worms are present. Earth-worms (*Lumbricus terrestris*) play a part in the infection with ascaris. The author found many well-developed ascaris eggs in the intestines of earth-worms.—M. J. J. HOUTHUIS (ROTTERDAM).

DE BOER, E. (1935). Experimentelle Untersuchungen über *Ascaris lumbricoides* des Menschen und des Schweines. [*A. lumbricoides* **in Human Beings and in Swine**].—*Z. InfektKr. Haustiere.* **48.** 248-269. [Numerous refs.]

A. lumbricoides, both of the pig and of man, developed fully to the sexually-mature stage in young pigs, but repeated experimental infections with eggs were necessary to effect this. The kind and number of eggs had no influence on the infections. This result supports the view that the forms of this species found in man and in the pig are physiologically identical, and hygienic measures should be based on this view until the contrary is conclusively proven.

The difficulty of infecting the pig with eggs of its own form of the worm is explained as being due to the high natural resistance usually present in pigs, which enables the animals to withstand a single infection. When an infection occurs this natural resistance is reinforced, when a certain number of worms is present, by a new kind of resistance which prevents the development of the young stages of the parasite, by a process as yet undetermined. The so-called age-resistance is of minor importance.

Lack of vitamin A in the food of young pigs does not favour the development of the worms in them. The whole development of these worms from the ripe egg to the fully-grown, sexually-mature stage is completed in about two months. The development of the males of human ascarids in pigs is markedly slower than that of the forms from the pig [see previous abst.].—G. LAPAGE.

IMMUNITY.

JØRGENSEN, M. (1935). Reaktionstallet ved den intrakutane Tuberkulinprøve. [**The Reaction in the Intradermal Tuberculin Test**].—*Medlemsbl. danske Dyrlaegeforen.* **18.** 369-377. 7 tables.

The author prefers the shoulder site. Of 3,650 reactors, the average increase in skin measurement was 9·8 mm. and young animals tended to yield stronger reactions than adults (yearlings, 13·7 mm. and young calves, 17·8 mm.). The most pronounced reactions were obtained in freshly infected animals. Small reactions (below 3 mm.) were seldom seen. There was no relation between the natural thickness of the skin and the extent of the reaction. In a herd still showing small reactions to injections of mammalian tuberculin after tuberculosis is believed to have been eradicated, it is desirable to counter-test with avian tuberculin in case the avian type of infection is present.—J. E.

WATANABE, Y. (1936). **Further Studies on Titration Methods of Diagnostic Tuberculin.**—*Kitasato Arch.* **13.** 9-14. 2 tables. [In English].

It is suggested that the potency of unknown tuberculins should be determined by comparison with a standard tuberculin in calves or guinea pigs sensitized with a carbolized suspension of dead *Mycobact. tuberculosis.* It is asserted that after three doses of such a suspension at weekly intervals the animals will react to the intracutaneous injection of 0·1 c.c. of a 1 : 100,000 dilution. Sensitivity declines by the eighth month, but can be reinforced by further injections.—R. E. GLOVER.

BOQUET, A., & SANDOR, G. (1936). Essai de préparation d'une tuberculine purifiée. [**The Preparation of a Purified Tuberculin**].—*C. R. Soc. Biol. Paris.* **121.** 99-100.

It is stated that only two-thirds of the tuberculinogenic principle is precipitated from synthetic medium tuberculin by trichloracetic acid, but that the whole can be recovered by precipitation with phosphotungstic acid in the presence of sulphuric acid. The latter method gives a product which is extremely stable and has an activity reaching 100,000 reacting doses per c.c. It is less toxic for tuberculous guinea pigs than " O.T."—R. E. GLOVER.

SARNOWIEC, W. (1935). La réaction allergique dans les infections aiguës. [**The Allergic Reaction in Acute Diseases**].—*C. R. Acad. Sci., Paris.* **200.** 698-700. [2 refs.]

This article records the details of the methods of preparation and use of antigens for the demonstration of allergic phenomena in swine fever and foot and mouth disease. Descriptions of the local, thermal and general types of reactions in infected animals are given, together with those observed in the control animals. The author concludes that it is possible, in acute infections due to filtrable viruses, to provoke allergic reactions in many ways analogous to those observable in chronic diseases such as tuberculosis.—F. BLAKEMORE.

GRIMARD, L. (1936). Recherche d'anticorps et d'antigène spécifiques dans les urines de la femme enceinte. [**Specific Antibodies and Antigens in the Urine of the Pregnant Woman**].—*C. R. Soc. Biol. Paris.* **121.** 743-746.

The author has endeavoured to evolve a test for pregnancy in women. In the first experiments, male rabbits were immunized with extracts of placenta from guinea pigs. The sera of the rabbits were mixed with the urine of pregnant women in complement-fixation tests.

In another series of experiments, female rabbits were immunized with the urine of pregnant women. The sera of the rabbits were mixed with the urine of pregnant women as above.

In both experiments the urine of pregnant women fixed complement, but the control urines from men and from non-pregnant females also did so.—D. L. H.

BROCQ-ROUSSEU, D. (1935). Les antitoxines naturelles des sérums normaux. **[Presence of Natural Antitoxins in Normal Blood].**—*Rev. Path. comp.* **35.** 1349-1355.

Appreciable quantities of antitoxin for *Clostridium tetani*, *Corynebact. diphtheriae* and *Staphylococcus aureus* have been found in the blood of animals which have apparently not suffered from these infections.—E. J. PULLINGER.

EICHHORN, E., & RICHOU, R. (1936). Recherches expérimentales sur les " vaccinations associées " (antitétanique et antistaphylococcique). **[Simultaneous Vaccination against Tetanus and Staphylococcus Infection (" Associated Vaccines ")].**—*C. R. Soc. Biol. Paris.* **121.** 309-311. [3 refs.]

Neither antistaphylococcal nor antitetanic immunity (in rabbits and guinea pigs) was influenced by the simultaneous subcutaneous injection of tetanus and staphylococcus anatoxins, either in mixture or separately. This is thought to be due to the absence of a local reaction to the introduction of staphylococcus anatoxin, in contrast with the human subject in whom staphylococcal anatoxin produces a local reaction that is followed by increase of the antitetanic immunity.—J. W. E.

DONHAM, C. R., & FITCH, C. P. (1935). **The Use of Gelatin in Rapid-Test Preparations of Bact. abortus Antigen. Variations in the Effect of Gelatin, in Bact. abortus Antigen Preparations, on the Agglutination Titers of Bovine Serums.**—*J. infect. Dis.* **56.** 203-209. [7 refs.]

The use of gelatin in the preparation of suspensions for the rapid slide test for *abortus* agglutinins is not satisfactory because it increases the sensibility of the suspensions for some, but not all, sera.

The variation occurs both in the case of animals shown to be infected and those which are known not to be affected. These facts thus support the common assumption that " specific " and " non-specific " agglutination are dependent upon similar, if not identical, agglutinating forces. The phenomenon of hysteresis, *i.e.*, the influence of the mechanical, thermal or electrical treatment to which it has been previously subjected, does not measurably affect the sensitivity of " rapid-test " suspension, probably on account of the relatively minute amounts of gelatin which it contains.—A. W. STABLEFORTH.

BLINOV, N., & ZASLAVSKIJ, L. (1935). Ueber die Verträglichkeit von Menschen- und Tierblut. **[On the Compatibility of Human and Animal Blood].**—*Klin. Wschr.* **14.** 967-969. 2 tables.

According to Blinov and Zaslavskij, bovines and ovines each belong to one blood group and neither species has iso-agglutinins. The equine species shows, on the contrary, several groups whilst the swine examined by the authors belong to groups Oo, Aβ, Bα, and Bo.

The sera of all animals agglutinate human cells and, in the authors' experience, *vice versa*. The possible reasons for the fact that other workers have failed to show the latter is discussed.—A. W. STABLEFORTH.

DISEASES, GENERAL.

HOPKIRK, C. S. M. (1935). **Live Stock of New Zealand, with Special Reference to Disease Past and Present.**—*Rep. Aust. Ass. Adv. Sci.* **22.** 331-346. 2 tables.

Hopkirk commences with a historical outline of the introduction and settlement of the domestic animals in New Zealand, from the liberating of pigs and

goats by Captain Cook in 1778 up to the present time. He then goes on to discuss the principal diseases of livestock.

SHEEP SCAB was introduced with some of the first sheep and spread over most of the dominion. By means of compulsory dipping, and shooting sheep which had gone wild, the disease was eradicated by 1890 and the country has since remained free.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA was introduced about the middle of the 19th century, but was soon eradicated by a policy of slaughter and quarantine, and it has not been introduced since.

ANTHRAX has been introduced on a number of occasions, nearly always in unsterilized bone meal used for fertilizer. Regulations enforcing efficient sterilization of bone meal dealt effectively with this disease. For some unknown reason the disease did not persist on infected farms.

BLACKLEG was introduced and is still present, but is kept in check by vaccination.

JOHNE'S DISEASE has been recognized for the last 22 years, 35 farms being known to be affected at present.

TUBERCULOSIS.—Slightly below 6 per cent. of bovines are found to be infected at abattoirs. Of over 3,000 composite milk samples tested, only 1·2 per cent. showed tuberculosis on guinea pig inoculation. About 10 per cent. of swine are found to be infected.

CONTAGIOUS ABORTION is present in the majority of dairy herds. About 30 per cent. of all cows react to the agglutination test and about 5 per cent. of cows and 30 per cent. of heifers abort.

MASTITIS of dairy cows is a source of great loss. Vaccination has not given good results in controlled experiments. The control measures advocated are :– (a) grouping cows for milking according to laboratory examination of samples, and (b) teat disinfection.

New Zealand has been fortunate in that rabies, foot and mouth disease, glanders, rinderpest and cattle tick [*Boophilus australis*] have not been introduced. Infectious diseases present but not mentioned above are cow pox, arthritis in lambs, caseous lymphadenitis, lip and leg ulceration of sheep, and distemper in dogs.

DIETETIC DISEASES.

PHOSPHORUS deficiency in cattle and sheep is seen in some areas, in severe cases causing " rickets " in lambs and anoestrum in cows.

CALCIUM deficiency is less common. Milk fever is common on pasture with over 1 per cent. P_2O_5 and less than 0·7 per cent. CaO, and is almost unknown where the mineral content is reversed.

MAGNESIUM content of some pastures is low in New Zealand and grass tetany is common. Although subcutaneous injection of magnesium salts relieves the tetany, there is no certainty that magnesium deficiency is the direct and only cause.

EXCESS OF PROTEIN in the ration is thought to be the cause of sterility in bulls.

PREGNANCY TOXAEMIA of ewes is put down as a disease due to poor farm husbandry as it only occurs when the ewes lose condition toward the end of gestation.

The author concludes with a review of the history of the veterinary profession in New Zealand.—W. I. B. BEVERIDGE.

GRIGNANI, U. (1935). L'Abissinia dal punto di vista igienico zootecnico. [**Stock-breeding in Abyssinia (Including Livestock Diseases)**].—*Azione vet.* **4.** 334-339.

Abyssinia may be roughly divided into the highlands of the north and the

lowlands of the south and east. The lowlands are a continuation of the Somaliland desert and are not likely to be of much agricultural value. Between the mountains of the north, however, wide fertile valleys are to be found which should be capable of development. The subsoil of these areas contains sufficient moisture to grow forage crops, but drinking water is scarce and usually contains at least 50 per cent. of organic matter ; it cannot be used without purification. The days are extremely hot while the nights are cold.

Cattle, mules, camels, horses, sheep, goats and poultry constitute the livestock of the country, and rinderpest, contagious bovine pleuro-pneumonia, piroplasmosis, trypanosomiasis and fowl cholera are the common diseases. Apart from the work of the Italian serum institute at Addis Ababa, no attempt is made to check the ravages of disease.

Contagious bovine pleuro-pneumonia vaccine and rinderpest serum and vaccine are the chief products of the institute. A great difficulty in the preparation of rinderpest serum is to obtain cattle which are not suffering from piroplasmosis. However, the results have been encouraging and the mortality rate has not exceeded 1 per cent. when the serum-vaccine method of rinderpest immunization has been used. A virus disease of horses causes heavy losses. It is being successfully controlled by serum-virus inoculations [? African horse-sickness : no details given.—Ed.]

There is no doubt that if the country were organized it could support a far greater number of animals than it does at present. Improvement of the cattle could be easily accomplished by selection and the introduction of suitable bulls, and it should be possible to produce in five or six generations a race of cattle fairly resistant to protozoa. The horses at present in the country are suitable for the foundation of an improved breed and with attention to feeding and the provision of roads could be used to a greater extent for heavy work than is now possible. If, however, livestock breeding in Abyssinia is to develop, at least four main serum institutes would be required and each of these should be provided with ten sub-stations in order to cover the country satisfactorily.—J. A. Nicholson.

Michael, Viola M., & Graham, R. (1936). **Epizootological Data from Laboratory Diagnoses. [Diseases of Domestic Animals in Illinois].**—*Vet. Med.* **31.** 114-124. 11 figs., 1 map.

The data recorded in this article were collected at the Diagnostic Laboratories of the Division of Animal Pathology and Hygiene of the University of Illinois, and give an idea of the chief diseases in the state. A map shows how the 100,000 specimens received at the laboratory during the last four years were distributed throughout the state.

Horses.—1,102 specimens were received, the majority for parasitic diseases : strongylosis was most frequently found. Rabies was diagnosed seven times.

Cattle.—14·2 per cent. of 75,761 blood samples were positive for brucella infection. Mastitis was determined in 19·3 per cent. of 917 milk samples. Haemorrhagic septicaemia and mycotic infections were each determined 44 times. Rabies was diagnosed 12 times. Stomach worms and coccidiosis appear to be prevalent.

Sheep.—315 specimens were examined. Parasitic diseases formed the most important group ; haemorrhagic septicaemia was the most frequently found bacterial disease.

Pigs.—3,130 specimens were received. Swine fever was the most important disease and abortion the next. Parasitic diseases are common. Rabies was diagnosed five times and influenza ten times.

Dogs.—Alarming figures are given for rabies. In the year 1927 to 1928, 59·4 per cent. of 732 specimens examined were positive. In the whole country 107 persons died of rabies and 13 of these deaths occurred in Illinois. The incidence then declined until 1931, but has been increasing since this date and, in 1934 to 1935, 444 cases were determined in dogs.

Parasitic diseases form the next most important group.

Poultry.—6,800 specimens were received. Parasitic worms and protozoa are shown to be the most frequent causes of poultry losses. The order of incidence was coccidiosis (1,372), tapeworms (1,311), ascarids (730), capillaria (430), heterakis (177), amidostomum (82), blackhead (59) and filaria (8). This group accounts for about one-third of all poultry losses now, whereas the proportion was about one-fifth five years ago. The incidence of other important diseases was *Salmonella pullorum* infection (1,319), leucaemia (691), laryngotracheitis (484), cholera (294), tuberculosis (155) and typhoid (118).

The authors illustrate their data by statistical diagrams for each species of animal and combine all these in a diagram which shows the importance of the various animal diseases to public health.—C. V. Watkins.

—. (1935). Résolutions adoptées dans la 9e Session du Comité de l'Office international des Epizooties. I. Rage. II. Maladie d'Aujeszky. III. Peste porcine. IV. Anémies infectieuses. [**Resolutions Adopted by the 9th Session of the Committee of the Office international des Epizooties. I. Rabies. II. Aujeszky's Disease. III. Swine Fever. IV. Equine Infectious Anaemia**].—*Bull. Off. internat. Epiz.* **10.** 453-454.

I. Rabies.—The previous conclusions [passed at the fifth session of the Office international des Epizooties. *Ibid.* **5.** 256.] on the control of rabies were confirmed, and the opinion was expressed that the only really reliable method for the complete eradication of the disease from Europe is the destruction of infected dogs and cats and of all stray dogs. Vaccination was not recommended for general prophylaxis, except in countries which are unable to comply with the sanitary measures.

II. Aujeszky's Disease.—The necessity for further research was urged and members were asked to report to the committee the results obtained in their own countries.

III. Swine Fever.—The report of Futamura on swine fever [this *Bull.* **6.** 231.] was considered and the differences of opinion as to the value of vaccines were discussed. The continuance of immunization trials was suggested, but that the use of live virus should be confined to areas already infected, and even then local strains of virus only should be used.

The results of experimental work on swine fever immunization are to be collected for the purpose of later consideration by the committee.

IV. Equine Infectious Anaemia.—The reports of Carré and Verge and of Zwick on equine infectious anaemia [see this *Bull.* **6.** 418.] were considered, and its alarming spread throughout the world and the necessity for applying prophylactic measures were noted.

New research on aetiology, diagnosis at all stages – particularly of the latent type, immunization and treatment must be vigorously pursued before it is possible to exercise effective control.

Compulsory notification of the disease would give accurate information as to its geographical incidence, would supply fresh knowledge on the relevant factors or spread, and would enable the value of present hygienic control measures to be estimated.—J. E.

SEELEMANN. (1935). Zur planmässigen Galt- und Abortus-Bang-Bekämpfung. [**Systematic Control of Mastitis and** *Brucella abortus* **Infection**].—*Dtsch. tierärztl. Wschr.* **43.** 769-773.

SEELEMANN. (1935). Die Beteiligung des Tierarztes an der Erzeugungsschlacht durch Mitwirkung an den freiwilligen (staatlich geförderten) Bekämpfungsverfahren. [**Outline of Voluntary System for the Controlling of Bovine Tuberculosis, Contagious Abortion and Mastitis in Germany**].—*Tierärztl. Rdsch.* **41.** 785-791.

These articles are unsuitable for abstraction. The author emphasizes the great need of controlling these diseases and explains the obstacles which impede the efforts of the individual, the institute or the state to effect such control. Finally, the general lines along which efforts at control should be designed are outlined. It is emphasized that the whole campaign must be adequately planned in advance, and willing co-operation of all participants must be forthcoming.—E. J. PULLINGER.

SEIFRIED, O., & HEIDEGGER, E. (1936). Untersuchungen über eine enzootisch auftretende Muskeldystrophie bei jungen Enten. [**Enzootic Dystrophy of the Muscles in Young Ducks**].—*Arch. wiss. prakt. Tierheilk.* **70.** 122-137. 8 figs., 1 table. [10 refs.]

A description of a disease, associated with lameness, which occurred in a large flock of ducks. The outbreak commenced shortly after Easter in each of three successive years, birds between the ages of four and five weeks being affected.

The authors divide the course of the disease into three stages according to the degree and extent of the paralysis. Difficulty of locomotion in the first stage becomes aggravated in the second stage, due to complete paralysis of both legs. Food is ingested if it happens to be near. The third stage consists of complete loss of movement, the bird lying on its ventral surface with the legs extended backward as in flight. Laboured respiration and profuse diarrhoea are soon succeeded by death. The three stages usually last in all about a week, exceptionally from 10 to 14 days, from the onset of symptoms. Recovery never occurs after the third stage has been reached, whereas a bird in the first two stages may completely recover within 24 hours.

The morbidity rate was 15 per cent. ; the mortality rate among affected birds was 50 per cent.

Post-mortem findings included areas of degeneration in various groups of skeletal muscles, particularly those of the thigh. Foci of degeneration were present in the musculature of the gizzard, with ulceration of the cuticular lining of this organ. The intestine showed wide-spread catarrhal inflammation and haemorrhages. Attempts to transmit the disease to healthy birds by inoculation of material from diseased ones was unsuccessful. Histologically, the affected muscles showed hyaline degeneration, fragmentation of the fibrillae and productive inflammatory changes. Food deficiency is suggested as a possible aetiological factor.—E. G. W.

VOGEL, W. (1934). Untersuchungen über das Wesen und die Histologie des hämorrhagischen Milzinfarktes beim Hunde. [**Nature and Histology of Haemorrhagic Splenic Infarcts in the Dog**].—*Inaug. Diss., Munich.* pp. 28. 4 figs. on 2 plates, 1 table. [17 refs.]

The author examined 30 spleens with lesions which showed a superficial resemblance to haemorrhagic infarcts. Detailed examination enabled the changes to be classified, according to the relation of the haemorrhage to the spleen tissue, as sub-capsular, peri-nodular and peri-trabecular. The production of these haemorrhages was considered to be due to damage of the vessel walls and subse-

quent rupture, consequent on a variety of factors including age and various chronic diseases such as enteritis, nephritis or chronic suppuration.

Small haemorrhages are followed by absorption or encapsulation. Fusion of several small haemorrhages results in the production of a haemorrhagic infarct. Hyperplasia of the lymph follicles may occur as a reaction, and fusion of several of these results in the formation of large nodules (lymphomata). Haemorrhagic infarcts and lymphomata are thus essentially similar in origin.—E. G. WHITE.

HINSHAW, W. R., & ASMUNDSON, V. S. (1936). **Observations on Pendulous Crop in Turkeys.**—*J. Amer. vet. med. Ass.* **88.** 154-165. 2 figs., 4 tables.

This abnormality is characterized by a temporary or permanent distension of the crop with stagnant liquid or semi-liquid contents. The incidence, symptoms, course of the disease and autopsy findings are fully described.

Heredity is probably the most important factor influencing the incidence of the disease, but birds having the same genetic constitution may or may not develop the abnormality depending upon certain environmental conditions. Most of the cases observed were in poults between nine to 12 weeks of age, and were associated with excessive liquid consumption during heat waves accompanied by extremely low humidity.

Various methods of treatment are described but none have proved to be very successful and selection of resistant breeding stocks appears to be the logical means of prevention.—R. F. GORDON.

ENGEMANN, H. J. (1934). Ist die Mareksche Geflügellähme eine B-Avitaminose ? [**Is Marek's Fowl Paralysis an Avitaminosis B ?**]—*Inaug. Diss., Berlin.* pp. 30. 12 tables. [Numerous refs.]

Feeding experiments were carried out on 74 hens over a period of four months. The amount of vitamin B-free foodstuff was gradually raised to 92 per cent. of the ration. Forty-three hens died and five showed symptoms of weakness resembling paralysis. Pathological and anatomical examinations revealed no nervous disease in the case of three of these five hens, but a slight uniform thickening of both lumbo-sacral plexus and sciatic nerves was macroscopically observed in one, and in the case of the remaining hen a microscopic examination of the left axillary and left lumbo-sacral region revealed a slight perineural lymphoid cell accumulation in the lumbar region. The author does not consider that any of these symptoms are peculiar to Marek's paralysis.

Further experiments were carried out in which food rich in vitamin B was given to hens suffering from Marek's paralysis. There were no curative results. The author concludes that the cause of Marek's paralysis is not a poor vitamin B content in food.—M. BURKE.

ALT, H. L. (1935). **Experimental Goat's Milk Anemia.**—*Proc. Soc. exp. Biol., N.Y.* **33.** 48-52. 2 tables. [Numerous refs.]

It has been reported that an anaemic condition is produced in infants by the feeding of goat's milk and that it responds to liver, but not to iron therapy. This paper reports an investigation of this condition carried out on albino rats. Exclusive feeding of goat's milk to young white rats produced a hypochromic anaemia, not significantly different from that produced by the feeding of cow's milk. Treatment with (a) iron and copper, (b) liver containing anti-pernicious anaemia substance plus iron and copper, and (c) the haemoglobin-producing factor of Whipple revealed that the anaemia produced by feeding goat's milk showed a maximal response when treated with iron and copper. This result is therefore at

variance with that of other authors, but Alt shows that the specific nature of the condition has not yet been established and that age differences in experimental animals, as well as other variations in experimental conditions, might partly account for the divergence in results obtained by different authors.—J. STEWART.

MILLER, W. C. (1936). **Low Temperature Blood Meals as a Source of Essential Amino-Acids for Nutritive Purposes.**—*Vet. Rec.* **16.** 311-316. Discussion 316-321. 1 table. [13 refs.]

The author emphasized the importance of the presence of essential amino-acids in the protein part of foodstuffs for livestock and showed that they are in particularly rich concentration in blood meal, the method of preparation being a very important factor in the value of the finished article. He suggested that low temperature blood meal would be useful in the prevention of " post-weaning check " – a set-back in the weight gain on cessation of the milk diet, for flushing ewes in the autumn, for the prevention and treatment of piglet anaemia, for convalescence after trichostrongyle infestations in foals and conditions of a similar nature.—J. E.

LOMBARD, C., & LASSERRE, R. (1936). Ostéo-périostite diffuse et cancer chez le chien. [**Osteo-Periostitis and Cancer in the Dog**].—*Rev. vét., Toulouse.* **88.** 25-32. 7 figs. [2 refs.]

The presence of a diffuse osteo-periostitis, accompanied by dyspnoea, in a nine-year-old cocker bitch, suggested an association with pulmonary tuberculosis. Two mammary tumours were also present. A *post-mortem* examination failed, however, to reveal any trace of tuberculosis, and the dyspnoea was found to be due to metastases in the lungs of a spindle-celled sarcoma of the mammary gland. The bony changes consisted in a hypertrophy, with rarefaction, of the bones of all four limbs and of the pelvis, and a marked anchylosis of the tarsal articulations. Other lesions included valvular endocarditis, chronic nephritis, and liver cirrhosis.

A review of the literature shows a paucity of recorded cases of osteo-periostitis in the dog, unassociated with tuberculosis.—E. G. WHITE.

PUBLIC HEALTH.

—. (1935). **Public Health Service Milk Ordinance and Code : 1935.**—*Publ. Hlth Bull., Wash.* No. 220. pp. v + 114. 15 text figs., 14 figs. on 8 plates, 8 tables.

The United States Public Health Service and the Bureau of Dairy Industry of the U.S. Department of Agriculture have approved a Milk Ordinance and Code which they recommend for adoption by states and communities in order to encourage a greater uniformity of milk control practice in the United States. A board of consultants, called the Public Health Service Milk Sanitation Advisory Board, has been appointed to advise on technical questions.

The ordinance regulates the production, transport, processing, handling, sampling, examination, grading, labelling, regrading, and sale of milk and milk products ; the inspection of dairy herds, dairies and milk plants ; the issuing and revocation of permits to milk producers and distributors ; the placarding of restaurants and other establishments serving milk or milk products, and the fixing of penalties. It defines the various grades of milk and prohibits the sale of adulterated, misbranded or ungraded milk or milk products.

For Grade A raw milk a physical examination and (with certain special

exceptions) a tuberculin test of all the herds and additions thereto must be made, before any milk therefrom is sold, and at least once every 12 months thereafter, by a licensed veterinarian approved by the State Livestock Sanitary Authority. All reactors must be disposed of in accordance with the requirements of the Bureau of Animal Industry for accredited herds. For diseases other than tuberculosis, such tests and examinations as the Health Officer may require must be made and all diseased animals and reactors disposed of. Regulations regarding the different grades of raw and pasteurized milk are set out.

The code is a detailed explanation of the ordinance, giving reasons for each rule and defining what will be considered a satisfactory compliance with the provisions. These details include descriptions, with plans and illustrations, of suitable milking barns, dairies, lavatories, sewers, springs and wells, boiler houses, cooling vats, pasteurization plants, bottling plants and other equipment.

In regard to the tuberculin test, the code adds the requirement that the veterinarian must furnish the Health Officer with a copy of the test charts describing every animal and giving ear-tag numbers. The Bureau of Animal Industry and the State Livestock Board or the State Veterinarian will co-operate with the City or County Boards of Health in testing dairy cattle, provided the requirements of the state veterinarian are met.—F. Bullock.

Schmidt, W. (1935). Gesundheitsüberwachung der Milchviehbestände. [**The Public Health Control of Dairy Farms**].—*Dtsch. tierärztl. Wschr.* **43.** 641-645. 2 tables.

Schmidt sets out in this article the result of an enquiry into two zones of dairy farms : the description is in two parts, the first dealing with self-contained herds and the second with flying herds. In all, 55,708 cows were examined and in the course of a year 23·3 per cent. were removed from the herds on account of disease. In the self-contained herds, 4,030 out of 8,052 were slaughtered on account of tuberculosis, udder diseases, sterility and other diseases. Schmidt considers that about 70 per cent. of the cases of sterility were curable but he does not classify the nature of the conditions responsible. In the flying herds, more than half of the animals were removed from the herds on account of disease. Schmidt considers that a regular professional supervision of the herds is essential, as by that means special attention could be given to the discovery of disease which would thereby facilitate the campaign against tuberculosis, etc. He considers that the cost should be kept as low as possible and suggests a levy of RM.3 per cow. [This figure is obtained by assuming that the average cow gives 3,000 litres during a lactation period and that at Pf.0·1 per litre this would amount to RM.3]. The levy should be borne equally by the different branches of the dairy industry. Examinations should take place twice a year. Herds producing drinking milk should be dealt with before all others.—G. Dods Munro.

Goyal, R. K., & Obermann, G. (1936). Recherche des bacilles tuberculeux dans le beurre et le fromage blanc. [**Tubercle Bacilli in Butter and Cheese**]. —*C. R. Soc. Biol. Paris.* **121.** 306-307. [3 refs.]

Two instances of the recovery of tubercle bacilli from butter are recorded. In one the organism was recovered by inoculation of guinea pigs with the centrifuged deposit from 60 g. of a mixture of 16 samples of butter melted at 40°C. This strain produced an abscess at the site of subcutaneous inoculation in the guinea pig, with regional lymphadenitis. In the other case, the organism caused generalized tuberculosis in a rabbit which was fatal in 35 days.

Tubercle bacilli were not demonstrated in 15 samples of cheese either by culture or by animal inoculation.—J. W. Emslie.

I. Reichle, H. S. (1936). **Primary Tuberculous Infection of the Intestine.**—*Arch. Path.* **21.** 79-87. 1 table. [14 refs.]

II. —. (1936). **Milk-Borne Tuberculosis.**—*Brit. med. J.* Feb. 29th. 423.

I. Reichle, of Cleveland, United States of America, records a case of primary abdominal tuberculosis in a child, a rarity in the U.S.A., although the figures quoted from other countries are much higher. Primary abdominal infection amongst all cases of tuberculosis occurs as follows :– U.S.A. 4·3 per cent., Germany 5·3 per cent., Austria 3·9 per cent. and England 34·2 per cent. It is taken for granted that the enormous difference is due to the high percentage of tuberculous cattle in England.

II. In an account of cases of primary intestinal tuberculous infection and conclusions drawn from autopsies and available literature, the percentage of primary intestinal infection is given as much higher in the British Isles than in other countries. It is agreed that this is due to the unusually high percentage of tuberculous cattle, as raw milk is mainly used in England. On the Continent, where milk is regularly boiled before use, the percentage of infections by ingestion is correspondingly low. The infections are mainly due to the bovine type of tubercle bacillus. Most of such infections in the U.S.A. and Canada occur in sections of the country where milk is neither pasteurized nor boiled.

—Brennan DeVine.

Schumann, P. (1935). Ausmerzung eutertuberkulöser Kühe nach Untersuchung der Sammelmilchproben. [**The Elimination by Bulk Milk Tests of Cows Affected with Udder Tuberculosis**].—*Dtsch. tierärztl. Wschr.* **43.** 658-659.

In this article the author advocates the examination of bulk samples of milk in preference to clinical examination. Instances are given in which affected animals have not been detected by clinical manipulation, and considerable confusion and economic loss have occurred later, tuberculin not having been used.

By the adoption of this procedure in Silesia the incidence of tuberculous bulk milk samples has fallen from 5 per cent. in 1926 to 1·8 per cent. in 1934.

—N. S. Barron.

Renner, B. (1936). Die Plattenpasteurisier-Apparate unter Berücksichtigung der neuen amtlichen Vorschriften über die Erhitzung der Milch. [**Plate Pasteurizing Apparatus Complying with the New Regulations for Heating Milk**].—*Dtsch. tierärztl. Wschr.* **44.** 84-87. 6 figs.

A regenerative type of pasteurizing plant is described, capable of heating milk to 85°C. Milk is heated while passing along shallow grooves between corrugated plates. The plates are warmed by the hot milk passing back in adjacent grooves. The initial temperature is achieved by steam jacket. The apparatus can also be adapted for cream pasteurization.—E. J. Pullinger.

Wright, H. D. (1936). **The Cultivation of Streptococci from Pasteurised Milk.**—*J. Path. Bact.* **42.** 31-44. 9 tables. [18 refs.]

Difficulty is experienced in the cultivation for bacterial count purposes, on standard media, of streptococci from some raw and pasteurized milk ; high dilutions (above 1 : 100) fail to produce the number of colonies which are to be expected from the examination of larger quantities of milk. This is due to the fact that many of the colonies are very small (pin-point colonies). Most of these colonies consist of true thermophiles and failure is often due to incubating at too low a temperature.

The ordinary standard agar media are unsatisfactory where such organisms

predominate but the addition of sterile milk or fermentable carbohydrates abolishes the discrepancies. Such media, however, are tedious to prepare and it is not always possible to know if the milk has been pasteurized.

The best results are obtained by the use of infusions of agar and milk which are cheap and almost as easily prepared as the standard media.—H. E. BYWATER.

KNOWLES, N. R. (1936). **A Study of the Bacterial Flora of Fore-Milk and of Rennet Extract, with special reference to Acid-Proteolytic Types.**—*J. Dairy Res.* **7.** 63-74. 5 tables. [19 refs.]

Fore-milk taken under aseptic precautions was found to contain relatively few bacteria capable of digesting casein under acid conditions. From 58 cultures of cocci isolated, only four types fulfilled these conditions, namely, *Staphylococcus* sp., *Streptococcus liquefaciens*, *Micrococcus caseolyticus*, and *M. freudenreichii*. Rennet, especially older samples, contained a more diverse flora of acid-proteolytic cocci than fore-milk. Udder types occurring in the rennet were probably derived from the milk fed to the calves from which the " vells " for rennet manufacture were obtained.—N. J. SCORGIE.

PACKBIER, A. (1935). Die Lumineszenz unter der Analysen-Quarzlampe ein diagnostisches Hilfsmittel zur Feststellung krankhaft veränderter Milchproben. [**Fluorescence Analysis for Detecting Infected Cows' Milk**].—*Münch. tierärztl. Wschr.* **86.** 531-533. [14 refs.]

Pure fresh milk fluoresces with a pale yellow colour, turning to yellowish-green and sky blue on continued irradiation. Mastitis milk shows only a dirty grey or bluish-grey colour.

The whole problem is, however, very complex and sources of error are numerous, so that much research will be required before fluorescence analysis can be of practical importance in milk inspection.—J. E.

MAYER, O. G. (1936). **Uniform Meat Inspection.**—*J. Amer. vet. med. Ass.* **88.** 119-125.

Meat inspection in the United States of America, so far as federal control applies, is as nearly perfect as possible, but, as in Great Britain, a percentage of the meat consumed has been produced without having received guaranteed official examination.

Mayer deals with this subject in his paper very fully. While urging federal control of all meat inspection he submits that, if municipal control is agreed to, then the " uniform inspection code " proposed by the Commission on Inspection should be adopted. He further suggests that the federal government under such a plan should pay one-half of the expenses, the other half to be paid by the 48 different states.

The author states that uniform state inspection, properly administered and enforced, would result in the elimination of unfair and unscrupulous competition and give meat and meat products an enviable distinction in the eyes of the consumer. He urges the government, states, meat packers and the American Veterinary Medical Association to co-operate in bringing about the desired object.—T. D. Y.

PHYSIOLOGY.

BRAHM, E. (1934). Das " Corpus luteum " des Rindes in seinem anatomisch-physiologischen Verhalten während der Schwangerschaft und im Nachgeburtsstadium mit besonderer Berücksichtigung des Abdrückens des Corpus

luteum graviditatis bei der Retentio secundinarum. **[The Corpus Luteum in Pregnancy and the Puerperium]**.—*Inaug. Diss., Berlin.* pp. 30. 7 tables. [Numerous refs.]

The author has collected much information on the size and condition of the ovaries of numerous cows slaughtered during pregnancy. The findings are of physiological interest. No appreciable difference in size occurs in the corpus luteum during the course of gestation. The possibility of expressing the corpus luteum by hand *per rectum* appears to depend upon its distance from the surface of the ovary.—J. E.

I. MAREK, J., WELLMAN, O., & URBÁNYI, L. (1935). Weitere Untersuchungen über den chemischen Aufbau der Knockensalze. **[Further Investigations on the Formation of Bone Salts]**.—*Hoppe-Seyl. Z.* **234.** 165-175. 1 table. [3 refs.]

II. KLEMENT, R. (1935). Bermerkung zu der Arbeit von J. Marek, O. Wellman und L. Urbányi, " Weitere Untersuchungen über den Chemischen Aufbau der Knockensalze ". **[A Note on the Article of Marek, Wellman and Urbányi, " Further Investigations on Formation of Bone Salts "]**.—*Ibid.* **235.** 272. [7 refs.]

I. Controversy still continues regarding the chemical combination of calcium and phosphate in bones, some authors regarding it as a hydroxyl-apatite whilst others assume it is mostly in the form of tricalcium-phosphate and calcium carbonate. The bones of cows and calves were extracted with glycerol, glycerol and potassium hydroxide, and KOH and carbonate. It was found that the calcium phosphate compound of the bones hydrolysed in a manner similar to tricalcium phosphate. Thus the authors strongly support the theory that bone phosphate is composed chiefly of tricalcium phosphate and $CaCO_3$ with small amounts of trimagnesium and calcium alkali phosphates.

II. This is merely a reply to the above paper, the author affirming his faith in the apatite theory, but advancing no new data in support of his contentions.

—JAMES STEWART.

FRANKLIN, M. C. (1935). **The Lime-Requirements of Sheep.**—*N.Z. J. Agric.* **51.** 257-266. 4 tables. [12 refs.]

The paper deals very generally with the lime requirements of sheep, the data having been culled from various authors and the standards applied to experimental animals in the flock at Lincoln College, Canterbury.

The author deals with the increase in knowledge during the past 50 years and touches on the condition of milk fever and the so-called " Mairoa disease " of the North Island. Basing his opinion on sheep feeding experiments at Lincoln College, he claims that neither milk fever nor " Mairoa disease " can be due to deficiency of lime.

The paper mainly shows that there is ample lime in New Zealand pastures for sheep requirements, a ewe in Canterbury receiving grass with a lime content of 0·72 per cent.—C. S. M. HOPKIRK.

CHABRE, P. (1936). Étude sur les huiles de foie de morue. Leur teneur en vitamines A et D. **[Vitamin A and D Content of Cod Liver Oil]**. pp. 211. 28 text figs., 8 figs. on 5 plates, 39 tables. [Numerous refs.] Marseilles : Imprimerie de la Société du " Petit Marseillais ". [8vo].

The author of this book has concerned himself with the story of the production, refinement and utilization of cod liver oil, principally from the standpoint

of its vitamin content, in particular, vitamin A. At the beginning, the anti-infective nature of vitamin A is emphasized, supported by some evidence from industrial conditions in America. The largest producing country is Norway where the entire industry is under close state supervision. A fairly comprehensive description is given of the cod and allied Gadidae, of the more important fishing regions, and of the trawlers and fishing equipment employed.

The book includes an account of the catch, separation of the liver and of the oil extraction by various methods with the precautions taken to avoid vitamin destruction by sunlight and oxidation. The impurity, stearin, is removed after cooling to 0°C. and finally the oil is decolorized, stored under inert gases and bottled. Other features dealt with include certain physical and chemical properties of the oil, and the relationship of vitamin D to the sterols and of vitamin A with β-carotene. For vitamin A estimation, the spectrographic method of Chevallier and Dubouloz is fully described and compared with the Carr-Price method: the former method, it is claimed, indicates the amount of vitamin A destruction during manufacture as well as the actual amount present. Examination of commercial samples by this method indicated the general average superiority of French over Norwegian cod liver oils, with a greater amount of variation, and the need for proper state supervision is emphasized.

[Although the " anti-infective " nature of vitamin A is so prominent a feature of the book, the greater weight of scientific opinion is that this anti-infective nature, emphasized as conferring resistance to infection, has not been substantiated. HARRIS [this *Bull.* **6.** 553.] says " The bulk of recent work is also against the view, so widely held a few years ago, that a deficiency of the vitamin in our diet is the cause of many common infectious diseases "].—ALFRED EDEN.

CLAUDE, A. (1935). **Spreading Property of Azoproteins in the Dermis.**—*J. exp. Med.* **62.** 229-244. 2 text figs., 3 figs. on 1 plate, 4 tables. [18 refs.]

Azoproteins are shown to have the property of spreading within the connective tissue layer when injected intradermally into the skin of the rabbit. The aromatic derivative selected for the coupling does not specifically affect the spreading property of the azoprotein, nor does the type of protein except in quantitative respects. The spreading property is apparently derived from the azo-group, and the spreading power seems to be determined by the number of diazo-groups which enter the protein molecule and to vary in direct proportion with the concentration of the solution. Azo compounds of low molecular weight fail to show any significant effect on skin permeability. No evidence has so far been found that azoproteins and testicle extract have a common mechanism of action although their final effect on tissue permeability may be the same.—A. W. STABLEFORTH.

MISCELLANEOUS.

PRÖSCHOLDT, O. (1935). 19. Dienstversammlung der Direktoren der Tiergesundheitsämter bei den Landesbauernschaften Preussens am 25. Brachmond (Juni) 1935 in Jena. [**19th Meeting of the Directors of Animal Health Offices of the Agricultural Areas of Prussia**].—*Berl. tierärztl. Wschr.* **51.** 772-776, 788-792 and 803-807. [5 refs.]

Twenty-nine directors of provincial animal health offices, including a few high officials from headquarters at Berlin, took part in this conference which is held annually. Certain members read papers on bovine tuberculosis, bovine contagious abortion and milk hygiene, and general discussions were held.

Summaries are given of the papers, which were published in full in the *Dtsch. tierärztl. Wschr.* and some also in the *Tierärztl. Rdsch.* These have been abstracted in this *Bulletin*.—J. E.

EISENMENGER. (1935). Organisation et fonctionnement du service vétérinaire aux opérations de l'Anti-Atlas (Maroc) en 1934. [**Organization of the Veterinary Service of the French Army of Anti-Atlas, Morocco, in 1934**]. —*Rev. vét. milit.* **19.** 537-562. 6 tables, 4 charts.

This article is concerned entirely with the organization of the veterinary service of the French army during the 1934 campaign in Morocco. It will thus mainly interest the military veterinarian. It includes, however, short notes on the more important conditions which incapacitated the animals of the force during this campaign and, in particular, an outbreak of epizootic lymphangitis. The subject matter is necessarily of a highly technical nature but it is so well laid out and subdivided that its purport is made quite clear. As a contribution to military veterinary history the article is of considerable interest and value.

The paper is in two parts. The first deals with the adaptation of the organization of the army veterinary service to the special requirements of a Moroccan campaign. The regular organization is first outlined, the procedure adopted in Morocco prior to 1934 is then described, and finally the arrangements for the 1934 operations are dealt with. The necessity for a modification of the original procedure is explained.

The second part constitutes a study of the veterinary history of the campaign. The disposition of troops, the allocation of veterinary personnel and veterinary units to the force, their distribution in the field, the scheme for the evacuation of the sick and for the replenishment of veterinary stores are all given in great detail. The inclusion of tables and charts materially assists in making the text clear. The incidence of sickness and the causes of inefficiency during the period of the concentration and the offensive are dealt with separately. Tables showing the establishment of veterinary units in personnel, animals and equipment are included.

A feature of the revised organization was the use made of mechanical transport in the early evacuation of sick animals, to which fact the author attributes the number and the rapidity of the recoveries recorded.—C. DAVENPORT.

TECHNIQUE.

WITTE, J. (1935). Beitrag zur Verbesserung der gebräuchlichen Apparate für die Erstarrung der Serum- und Eiernährböden zur Züchtung von Tuberkelbakterien. [**Improved Apparatus used for Coagulating Serum and Egg Medium for the Cultivation of Tubercle Bacilli**].—*Zlb. Bakt. I.* (*Orig.*). **135.** 424-426. 1 fig. [1 ref.]

An inspissator is described for the coagulation of serum and egg media which eliminates certain obvious faults of older types of apparatus. The temperature is more satisfactorily regulated since the inspissating chamber is entirely jacketed by hot water. The temperature of this water is regulated thermostatically. In addition, a pipe leads from the top of the water-jacket to the inside of the inspissating chamber. In this way water vapour passes into the chamber keeping the atmosphere moist.—E. J. PULLINGER.

SMITH, K. M., & DONCASTER, J. P. (1935). **The Preparation of Gradocol Membranes and their Application in the Study of Plant Viruses.**—*Parasitology.* **27.** 523-542. 7 figs., 2 tables. [8 refs.]

The preparation of satisfactory " gradocol " membranes [ELFORD – this *Bull.* **3.** 242.] depends upon strict adherence to a given technique. The causes of failure, as analysed by ELFORD, are given in greater detail in this paper. As numerous important points are discussed at length, the article should be consulted in the original by those interested in this subject.

The paper concludes with some general observations on the application of these membranes to the plant viruses. The successful filtration of these viruses is complicated by the fact that the plant juices contain many proteins which are easily precipitated and, therefore, quickly clog the membranes. It has been found that CO_2 will remove these proteins but that it has no action on the viruses which are left in solution. The effects of the virus content, purification and the pH of virus fluids upon their filtration are also discussed.—R. E. GLOVER.

OFFICIAL AND OTHER REPORTS.

NEW ZEALAND. (1935). **Report of Live-Stock Division.** [BARRY, W. C.]—*Rep. Dep. Agric. N.Z. 1934-35.* pp. 18-24. 4 tables.

This division deals with domestic animals in health and disease ; Inspection of Meat for Export, Dairies, Noxious Weeds, and Rabbits ; Importation of Stock ; Instruction in Poultry and Pig Husbandry, and Wool.

The general health of animals had been good throughout the year except for a large outbreak of facial dermatitis (photosensitization) of sheep in the North Island.

TUBERCULOSIS.—5·54 per cent. of cattle slaughtered were found to be affected in some degree, and 10·31 per cent. of all pigs slaughtered were affected.

JOHNE'S DISEASE was found to be on the increase.

ABORTION AND STERILITY gave no undue trouble. It was pointed out that an increase in research into these diseases is required.

FACIAL DERMATITIS caused severe losses in sheep. The photosensitivity in this trouble which occurred after drought on very luscious green rich pasture was severe and the after-effects, due to severe liver damage, were serious.

CASEOUS LYMPHADENITIS.—A system of " field " palpation to discover and remove affected animals has been useful : by this means a considerable reduction in the incidence has been effected, although it has not led to the eradication of the disease.

PLEURISY in pigs due to incorrect feeding and housing, and poor conditions on some farms, was giving concern. This was found at the abattoir in animals slaughtered for export.

Mention is also made of the many cattle, sheep and pig diseases of minor consideration.—C. S. M. HOPKIRK.

INDIA, BIHAR AND ORISSA. (1936). **Annual Report of the Civil Veterinary Department, Bihar and Orissa for the Year 1934-35.** [RILEY, P. B.] pp. 35 + xxxv + 4. 15 tables, 1 map. Patna : Supt. Govt. Printing. [8vo] [Rs.1-3].

The staff of the department consists of the director, three range officers, one disease investigation officer, 13 veterinary inspectors and 146 veterinary assistant surgeons. In addition, the principal and four professors are employed at the Veterinary College.

The year, on the whole, was a healthy one and the figures are regarded as the more satisfactory as there was a marked improvement in the reporting of diseases. The cost of inoculation against rinderpest was considerably reduced owing to the extended use of goat-blood and goat-tissue virus. The disease investigation officer studied outbreaks of distomatosis, bilharziasis and avitaminosis in fowls.

There were 33 veterinary hospitals and 134 field veterinary dispensaries at work and there was a large increase in the number of patients treated at these institutions and by the touring staff.

The number of admissions to the veterinary college was satisfactory and 47 students were under instruction at the end of the year.

In the research laboratory work on kumri was continued.

The Patna cattle breeding and dairy farm registered another year of successful working, although it is stated that the water supply is causing anxiety.—G. K. W.

INDIA, BENGAL. (1935). **Annual Report of the Civil Veterinary Department, Bengal and the Bengal Veterinary College for the Year 1933-34.** [KERR, P. J.] pp. 72. 15 tables, 1 chart, 8 appendixes. Alipore: Supt. Govt. Printing. [8vo] [4 annas] [5d.]

The departmental staff consists of the director, two assistant directors, eight veterinary inspectors and 128 veterinary assistant surgeons.

The year was a comparatively healthy one, the most striking decrease being in the mortality from rinderpest. The use of goat-tissue vaccine for rinderpest has been extended and is reported to have yielded excellent results.

One new dispensary was opened during the year, making 49 at work in the Presidency. It is admitted that the facilities for veterinary aid in the districts are still inadequate.

A veterinary investigation officer has been appointed who so far has been mainly occupied in the application of goat-tissue vaccination against rinderpest. A vaccine depot has been established and additional staff has been sanctioned to permit of operations being extended.

The Bengal Veterinary College (principal, MACGREGOR, A. D.) continues to attract a large number of candidates for admission from various parts of India and outside. During the year a revised curriculum was introduced and the title of the diploma changed. In the hospital of the college the daily average of patients treated amounted to 149.

A considerable amount of routine work was carried out in the Raymond research laboratory.—G. K. WALKER.

INDIA, MADRAS. (1936). **Annual Administration Report of the Madras Civil Veterinary Department for the Year 1934-35.** [SAUNDERS, P. T.] pp. ii + 37. 1 map, 4 appendixes. Madras: Supt. Govt. Press. [8vo] [12 annas].

The staff of the department consisted of the director, the veterinary investigation officer, 12 district veterinary officers, the officer in charge of the serum institute, the principal and seven lecturers at the veterinary college and 274 veterinary assistant surgeons.

There was a further decrease in the mortality from cattle diseases in spite of the fact that there was an increase in the figures for foot and mouth disease. The goat-virus method of immunization against rinderpest was given an extensive trial under field conditions with encouraging results.

The disease investigation officer paid particular attention to blackleg and preliminary investigations were undertaken in respect of other diseases. Supplies from the serum institute continued steadily and the cold storage accommodation has been extended.

The number of students at the veterinary college was 107. The introduction of the degree course has been postponed for financial reasons. Research work in the college laboratories was well maintained, and some interesting features are recorded, particularly in regard to the bovine nasal schistosomiasis investigation.
—G. K. WALKER.

INDIA, MYSORE. (1936). **Annual Administration Report of the Civil Veterinary Department for the Year 1934-35 with the Government Review thereon.** [KRISHNIENGAR, K.] pp. 17. 8 appendixes. [fcp].

The staff consists of the superintendent, five assistant superintendents, one of whom is in charge of the research section, and a number (not stated) of veterinary inspectors.

There was an appreciable decrease in the mortality from contagious diseases, particularly from rinderpest, compared with the previous year. The method of protection against rinderpest with goat virus alone was more extensively adopted.

There were severe outbreaks of anthrax in some districts and foot and mouth disease was wide-spread.

It is stated that parasitic diseases have become a serious problem.

There were 63 veterinary hospitals and dispensaries at work showing a considerable increase of activity. Special work on Johne's disease was carried out with a local strain, and deficiency diseases of livestock are receiving attention. An increased number of cases were treated by the touring staff. It is also stated that proposals are being made to utilize the services of the veterinary staff more widely for meat inspection in the municipalities of the state.—G. K. WALKER.

INDIA, MYSORE. (1936). **Annual Report of the Mysore Serum Institute, Hebbal, Bangalore, for the Year 1934-35.** [ACHAR, S. D.] pp. 11. 2 tables. [fcp].

The institute continued to manufacture several important biological products for controlling contagious diseases of livestock. The increased demand for goat-virus vaccine reduced the output of anti-rinderpest serum and bull virus. Blackleg bacterin was produced in much larger quantities as it was found to be superior to blackleg filtrate in the field. There was a good demand for products of the institute from places outside the Mysore State itself.

Three new products were issued for experimental use and research was continued in regard to others.

The financial working of the institute appears to be very satisfactory.

Eight professional papers were contributed by the staff of the institute during the year.—G. K. WALKER.

PALESTINE. (1934). **Report of the Veterinary Service for the Year ending March, 1934.** [SMITH, J. M.]—*Rep. Dep. Agric. Palestine, 1934.* pp. 43-60.

There was a serious shortage of grazing and heavy losses occurred in sheep, goats and cattle. No serious epidemic disease occurred.

The Chief Veterinary Officer is responsible for the following services :– field services, laboratory, quarantine stations, Acre stock farm, stock-breeding, Acre and district poultry stations and apiaries, and extension and experimental work in poultry and bee keeping.

DISEASES OF ANIMALS.

ANTHRAX.—166 outbreaks were reported in which 1,075 animals died. Annual vaccination is carried out by private veterinary surgeons in most of the Jewish settlements, otherwise vaccination is practised only when outbreaks occur.

TUBERCULOSIS.—A scheme for the control and eradication of this disease has been submitted to the Government.

Brucella abortus INFECTION.—Fifty-four herds comprising 3,302 cattle are now regularly tested.

BLACKLEG.—Prophylactic vaccination of young stock is carried out in infected areas.

EPIZOOTIC LYMPHANGITIS.—Sixteen cases were recorded, the affected animals being destroyed and the owners compensated.

DOURINE.—The policy of castrating infected stallions and branding infected mares is being continued.

FOOT AND MOUTH DISEASE gradually subsided during the summer until September when it disappeared. It was controlled by local quarantine and artificial inoculation.

INFECTIOUS PLEURO-PNEUMONIA of goats occurred in South Palestine.

RABIES continues to be prevalent and there were 118 cases. Wider powers for the control of this disease are being sought.

VARIOLA OF SHEEP AND GOATS.—Out of 14,500 animals involved, 4 per cent. died. Infected flocks or herds are segregated from the non-infected. It was impossible to prepare vaccine owing to lack of laboratory accommodation.

BOVINE EPHEMERAL FEVER.—Two outbreaks involving 12 cattle were reported.

TICK FEVER continued to cause severe losses. Dipping demonstrations were carried out in 17 centres, but drought conditions handicapped the work. 350 cases of tick fever were reported in dairy cattle and 68 deaths occurred.

MANGE increased in camels, but diminished in equines. The disease is still wide-spread in sheep and goats.

PARASITIC GASTRO-ENTERITIS in sheep and goats was less prevalent.

DISEASES OF POULTRY.—The mortality from disease is heavy. Pox, fowl typhoid, fowl cholera and cell inclusion diseases are notifiable. Vaccines are used against fowl pox and fowl cholera and serum against fowl typhoid.

ANIMAL HUSBANDRY.

Imports of livestock and livestock products have increased. The dairy industry is expanding rapidly. The beef and mutton requirements are met by importation. Local hides and skins are exported mainly to Syria and heavy hides are imported from London and Egypt. There are 26 tanneries in the country. The major part of the wool crop is used locally. Local dairy cattle are being successfully improved by crossing selected local cows with Friesian pure-bred bulls. Various cross-breeding experiments are being conducted at stock farms and agricultural schools. Selected bulls are distributed to the villages for breeding purposes and breeding experiments are also being carried out in an endeavour to improve the local breeds of sheep, goats and pigs. Eleven male donkeys and two Arab stallions are at stud and are in great demand. Inferior male animals in villages are being castrated to an increasing extent by veterinary officers. Government poultry stations sold a large quantity of pure-bred stock to farmers.

There are 59 persons licensed to practise veterinary surgery and medicine in Palestine.

MISCELLANEOUS SERVICES.

QUARANTINE SERVICES.—There are 14 land stations which dealt with 133,453 animals. Over 18 thousand transport animals and over 400 thousand poultry were also examined. At Haifa Port quarantine station 171 thousand animals were dealt with. The majority of slaughter cattle are imported from Bulgaria, Cyprus and Rumania, and most of the sheep and goats from Turkey.

MEAT INSPECTION.—The chief causes of condemnation were *Cysticercus bovis* infection, echinococcosis, distomatosis and strongylosis.

SERVICE TO POLICE AND ARMY.—Much time of the district veterinary officers is taken up in giving full veterinary service to the animals of the Palestine police and of the British troops.

VETERINARY LEGAL CASES.—Generally speaking, the number of cases of malicious poisoning and stabbing has decreased.—F. H. MANLEY.

UNZEITIG, H. (1936). Die österreichischen Veterinär-Jahresberichte 1931 bis 1934. **[The Veterinary Reports for Austria, 1931 to 1934]**.—*Wien. tierärztl. Mschr.* **23.** 1-18. 20 tables.

ANIMAL HUSBANDRY.—Detailed information is given. The 1934 census gave the following data :– 261,000 horses, 900 mules and asses, 2,349,000 cattle, 263,000 sheep, 326,000 goats, 2,823,000 pigs, 8,679,000 chickens, 100,000 ducks and 93,000 geese. Since 1923 pigs and poultry have increased in number appreciably.

NOTIFIABLE ANIMAL DISEASES.

ANTHRAX caused much loss in 1931, but has decreased steadily since. Vaccination is widely employed.

BOVINE TUBERCULOSIS.—Only three out of the nine provinces have any organized control scheme and in these areas the percentage of infection fell from 19·5 in 1931 to 14·2 in 1934.

SWINE ERYSIPELAS causes rather severe losses every year and artificial immunization is employed.

GLANDERS.—Only rare cases were diagnosed in each of the four years.

HAEMORRHAGIC SEPTICAEMIA.—A few cases in cattle appeared in parts of Austria.

FOWL CHOLERA caused rather severe local losses during the years under review.

BLACKLEG is enzootic in Austria and is controlled by vaccination, with a reduction in the average loss from 0·6 to 0·1 per cent.

DOURINE.—No cases were reported.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA and RINDERPEST have been absent for many years.

FOOT AND MOUTH DISEASE was wide-spread in 1931, but had been eradicated from the greater part of Austria by 1934 ; the slaughter method of control was used.

GENITAL VESICULAR EXANTHEMA was observed to increase gradually in mares and cows in each of the four years, but its incidence is localized.

SWINE FEVER and SWINE PLAGUE are considered jointly ; they showed a stationary incidence, each year causing losses of about 10,000 pigs annually.

RABIES.—The incidence of rabies varied considerably in the four years, its presence in adjoining countries being a perpetual menace.

SHEEP POX.—No cases were reported.

FOWL PLAGUE was only observed in one farm in 1932.

EQUINE MANGE AND SHEEP AND GOAT SCAB were present to a small degree in 1931 to 1934.

GENERAL.—The number and geographical location of veterinary surgeons in Austria is given. In 1934 there were 1,082, of which 623 were in private practice.

—J. E.

—. (1935). Mededeelingen betreffende den Gezondheidsdienst voor Vee in Friesland. Zestiende Jaarverslag 1934-1935. **[Holland : Notes on the**

Health of Livestock in Friesland from 1934 to 1935]. pp. 43. 6 tables, 3 graphs. [8vo].

The tuberculin test, together with sputum examination when necessary, was applied to 7,000 herds containing 163,000 animals, of which 3,700 herds (60 per cent.) containing 140,000 animals were free from tuberculosis. The farmers in Friesland are hoping that the government will now help in the removal of all reactors. In cattle infected with *Brucella abortus*, the blood-serum agglutination test was used ; 116 herds were examined and 4,200 samples of blood taken. It was necessary to vaccinate the young animals in the heavily infected herds.

The incidence of Johne's disease increased ; 1,649 samples of faeces were examined and 386 (23·4 per cent.) gave positive results. The greatest possible care should be taken of the calves in herds that are " clean ", in order that they do not come in contact with infected material from outside the herd, such as manure. Reference is made to a heavy infection of young cattle which occurred three years after they were placed on pasture treated with manure from clinical cases.

For the control of mastitis bacteriological assistance is necessary, combined with the isolation of infected animals and the use of " entozon " infusions.

—M. J. J. Houthuis (Rotterdam).

Esthonia. (1935). Rapport du Service vétérinaire pour l'année 1933. **[Report of the Veterinary Service for 1933].** [Herodes, A.]—*Bull. Off. internat. Epiz.* **11.** 59-64. 4 tables.

Outbreaks of disease were apparently more numerous than in previous years, probably because a higher percentage was reported.

10,959 head of cattle were tested for tuberculosis, as against 3,123 in 1924. Simultaneously, the percentage of reactors fell from 56·3 to 31·1. The incidence was highest in native breeds and lowest in Ayrshires and Friesians. Anthrax was less common, owing to the strictness of the regulations. Following the use of serum, the mortality from swine erysipelas was reduced from 50 to 6·5 per cent., but the incidence was greater than in the previous year. *Brucella abortus* infection tended to spread ; in connexion with this disease, approximately 7,000 agglutination tests were carried out at the sero-therapeutic institute at Tartu.

Malignant catarrh was frequently observed when cattle and sheep were housed together, the latter animals appearing to be carriers of the disease, although themselves insusceptible.

Rabies continued to spread, the control of dogs being difficult to enforce.

Enzootic hepatitis of young pigs showed an increase.—E. W. Ascoli.

Italy. (1935). Istituto Zooprofilattico Sperimentale delle Tre Venezie aggregato alla R. Università Padova. Relazione sull'attività svolta dall'Istituto durante l'anno 1934. Osservazioni, studi e considerazioni. **[Report of the Veterinary Research Institute, Padua, for 1934].** [Bardelli, P.] pp. 43. 6 tables. [7 refs.] Padua : Tip. Penada. [8vo].

The activities of the institute extended considerably during 1934 and its affiliation to the University of Padua greatly increased its prestige. The number of specimens submitted for examination was large and the biological department received heavy calls, particularly for swine erysipelas serum and vaccine, and fowl cholera vaccine.

Bovine contagious abortion continues to give rise to serious losses and is wide-spread throughout the province. The use of live vaccine was confined to animals which had aborted or to farms on which the majority of the herd reacted

to the agglutination test ; in other cases a carbolized vaccine was used. Trichomonas infection of cattle was recorded on numerous farms. Many cases of bovine sterility were treated during the year. The common lesions were acute or chronic vaginitis, cervicitis and endometritis and persistent corpora lutea.

The work on fluorine cachexia in cattle and goats was completed. It was shown that the daily administration of 1 to 4 g. of sodium fluoride for about four months produces typical symptoms of poisoning in cattle. The source of fluorine in the affected district was traced to an aluminium factory.

Bovine piroplasmosis was successfully treated by intravenous injections of 1 g. of " trypaflavine " in 40 to 50 c.c. of distilled water. This was given as one dose and to be effective should not be given later than the second day of the disease.

—J. A. NICHOLSON.

ASCOLI, A. (1935). La relazione del Prof. A. Ascoli. [**Report on the Work of the Istituto Vaccinogeno Antitubercolare, Milan**].—*Notiz. Ist. antituberc., Milano.* **13.** 12-19.

After reviewing the progress and activities of the institute since its foundation in 1924, the author points out that the conclusions concerning the value of BCG have always been based upon experiments on calves. The results of these have been so satisfactory that, in 1934, the controlling committee felt justified in recommending that babies dangerously exposed to a tuberculous infection should be vaccinated with BCG at birth and 2,812 doses of vaccine have been issued for human use. It is estimated that 15,000 animals are regularly vaccinated or revaccinated annually in Italy, and the results of 2,400 *post-mortem* examinations have shown that of these only 6·29 per cent. were affected with tuberculosis. New experiments are being undertaken on a large scale to determine whether annual inoculation with BCG vaccine will protect calves for the duration of their economic life. These are designed to last five years.—J. A. NICHOLSON.

DUTCH EAST INDIES, EAST JAVA. (1935). Provinciale Veeartsenijkundige Dienst. [**Report of the Provincial Veterinary Service for 1934**]. [KUNEMAN, J. H. B.] —*Jversl. Prov. Oost-Java, 1934.* pp. 156-177. 9 tables.

The veterinary staff consisted of the Chief Veterinary Officer, 6 divisional veterinary officers and 11 native veterinary surgeons, as well as stockmen, etc.

ANIMAL DISEASES.—No cases of anthrax occurred and only a few of blackleg. Tuberculosis was observed in 242 cattle, but not in buffaloes. 280 cases of glanders occurred. Haemorrhagic septicaemia was observed in 31 buffaloes and 6 cattle : vaccination was employed to a considerable extent. Epizootic lymphangitis occurred in 94 horses, of which about half recovered.

Rinderpest was not observed. Foot and mouth disease was wide-spread but losses were insignificant : some cases were treated with " trypaflavine " intravenously. Cases of death from degeneration of internal organs [no details] after apparent recovery from foot and mouth disease were reported. Rabies was diagnosed in six dogs. No cases of swine fever occurred.

Surra was diagnosed in 124 horses, 364 buffaloes and 152 cattle. Mortality was heavy in horses but slight in buffaloes and cattle. " Naganol " was used as a preventive and " naganol " with " arsokoll " as a curative. A few cases of piroplasmosis and anaplasmosis were observed in buffaloes and cattle ; " trypaflavine " was used for treatment. Dourine was not observed.

Information is also given on import and export of livestock, on abattoir traffic, meat and milk inspection and on livestock.—M. J. J. HOUTHUIS (ROTTERDAM).

UNITED STATES OF AMERICA, MINNESOTA. (1935). **[Report of the Division of Veterinary Medicine (1885-1935)].**—*Bull. Minn. agric. Exp. Sta.* No. 319. pp. 63-67.

In this review of 50 years work, in addition to some general remarks on tuberculin testing and bovine contagious abortion and sterility, a short report is given of deaths in cattle after drinking from a lake. The poisonous agent was found to be algae [not named and no details]. Attempts to produce poisoning by feeding animals on Sudan grass grown, stored and handled in various ways were unsuccessful.—J. E.

GREAT BRITAIN. (1936). **Report of the Medical Research Council for the Year 1934-35.** pp. 183 + xi. [Numerous refs.] London: H.M. Stat. Off. [8vo] [3s.]

The report is divided into the following seven main sections :- (1) an introduction, describing briefly the general nature of the research work covered; (2) the Work of the National Institute of Medical Research; (3) the Determination of Biological Standards and the Methods of Biological Assay and Measurement; (4) Clinical Research Units; (5) External Research Schemes; (6) Industrial Health, and (7) Travelling Fellowships. The composition of the Investigation Committees for Special Subjects is given in an appendix.

A grant-in-aid of £165,000 was voted by Parliament during the financial year, £9,500 being allocated to administration and travelling expenses of the Council, £58,500 for the National Institute for Medical Research at Hampstead and the farm laboratories at Mill Hill, and £97,000 for research grants to scientific work elsewhere. Important additions to this public monetary grant were received from other sources.

THE NATIONAL INSTITUTE FOR MEDICAL RESEARCH.

DISEASES CAUSED BY VIRUSES.—Research on viruses and virus-like infective agents continues to occupy a prominent position in the Institute's program.

INFLUENZA.—It has not yet been found possible to infect mice directly from human cases. The possibility of infecting ferrets with human virus and then transmitting infection to other ferrets and mice has been confirmed.

PSITTACOSIS.—It has been proved that mice may be immunized by repeated injections of rich emulsions of the virus, inactivated either by treatment with weak formaldehyde solution or by exposure to light in the presence of methylene blue.

VESICULAR STOMATITIS.—The possibility has been confirmed of differentiating the virus from that of foot and mouth disease by the size of the infective units and by the readiness with which the virus of vesicular stomatitis can be cultivated in the membranes of the developing chicken embryo. Investigations are in progress as to the possibility of recognizing and photographing the infective units.

OTHER RESEARCH WORK.—" Louping ill ", artificial cultivation of viruses, photodynamic inactivation and measurement of dimensions of virus units have been studied.

In the chemical section further work has been carried out on the accessory factor which must be added in traces to an otherwise efficient " synthetic " medium to enable the growth of certain bacteria to be maintained. Johnin has been steadily improved both in potency and specificity. An acid-fast organism has been isolated from the intestinal mucosa of sheep affected with a condition resembling Johne's disease; after a seven months' incubation period artificial cultivation has now been effected, and growth has been observed on subcultures.

Research work has also been carried out on the chemistry of sterols and

related substances, individual specificity, pharmacology of ergot, etc., chemical transmission of nervous effects, sex hormones, prolonged inhalation of tar dust, etc., and oxygen requirements.

THE DETERMINATION OF BIOLOGICAL STANDARDS.

A regular distribution has been maintained of the standards held by the Institute under the Therapeutic Substances Act, or on behalf of the Health Organisation of the League of Nations, or for the British Pharmacopoeia. These cover bacterial suspensions and antisera, toxins, tuberculins, vitamins and hormones.

THE NATIONAL COLLECTION OF TYPE CULTURES.

Over 5,000 cultures were distributed and 250 new cultures were deposited for maintenance.

THE STANDARDS LABORATORY, OXFORD.

The work of producing and standardizing bacterial suspensions and agglutinating sera for the diagnosis of bacterial infection has been continued ; between 350 and 400 laboratories at home and abroad have made use of this service.

EXTERNAL RESEARCH SCHEMES.

A very wide range of subjects was studied at outside institutions with the help of monetary grants from the Council, including hormones, heart disease, goitre, pernicious anaemia, treatment with hog's stomach, nephritis, the mechanism of pain, anaesthetics, nutritional anaemia in children, vitamins, neurology, certain surgical investigations, genetics, cell and tissue growth, radiology, general physiology, biochemistry, pathology, epidemiology and statistical investigations, etc.

The enquiry into the frequency with which bovine tubercle bacilli cause phthisis and other forms of tuberculosis in man has been continued at Cambridge. Further observations on the practicability of immunizing calves to tuberculosis with intravenous injections of BCG vaccine were made with a view to testing the duration of immunity given, and to establishing its value as a protective agent under farm conditions where segregation is either impossible or is inevitably followed later by exposure to infection.

Work has been carried out at St. Albans on the influence of nutrition on immunity to worm infestations. Observations on the effects of diet in the infestation of chicks with *Trichostrongylus tenuis* indicate that magnesium and possibly calcium may influence resistance to the parasite. The immunity of young fowls to gapeworm disease has been shown to depend upon an adequate supply of vitamins in the diet.

—J. C. WALLACE.

BOOK REVIEWS.

—. (1935). **History of the School of Veterinary Medicine of the University of Pennsylvania 1884-1934.** pp. 226. 25 plates, 3 tables. Philadelphia : Vet. Alumni Soc. [8vo].

The anonymous authors of this book have evidently gone to considerable trouble to unearth historical material and have produced a fine memorial volume of the Pennsylvania veterinary school, now housed in a beautiful building, which was begun in 1907.

Attempts were made as far back as 1807 to study animal diseases and give instruction thereon in Pennsylvania, but it was not until 1884 that the school was founded, to be run under great difficulty until 1901, when the college site was

requisitioned for the expanding medical faculty of Pennsylvania University. During the next six years makeshift premises were used.

The book is of great general historical veterinary interest.—J. E.

HEWITT, L. F. [Ph.D., B.Sc., A.I.C. Biochemist at London County Council Belmont Laboratories, Sutton, Surrey]. (1935). **Oxidation-Reduction Potentials in Bacteriology and Biochemistry.** pp. 90. 26 figs., 9 tables. [Numerous refs.] London : London County Council. [3rd Edit.] [8vo] [2s.]

In this, the third edition of his publication, the author has incorporated a survey of much of the recent investigations dealing with oxidation-reduction potentials. The study of this subject has now advanced to such a degree in the fields of bacteriology and mycology, that deductions drawn from electrode potential measurements not only confirm results obtained by experiments such as the reduction of dyes, but also they give quantitative results in place of mere qualitative ones supplied by other types of experiment. No progress has been made yet in the study of intracellular potentials, but information is accumulating rapidly regarding the changes brought about by the cell upon its environment, and by the environment upon the cell.

In this publication the theoretical aspects of oxidation-reduction potentials are discussed, followed by a description of experimental methods. The oxidation-reduction systems of biological importance are then described, and all recent progress in their study is recorded. Finally, the application of these systems in practical bacteriology is considered.

In conclusion, it must be said that this work cannot be recommended to the uninitiated as a suitable introduction to the subject of oxidation-reduction potentials. Considerable understanding of the relevant aspects of physical chemistry is necessary if the text is to be fully appreciated.—E. J. PULLINGER.

BRAUCHLE, A. [Dr Med.], & VOSS, H. [Prof. Dr]. (1935). Grundriss der Normalen Histologie und Mikroskopischen Anatomie. **[Outline of Normal Histology and Microscopical Anatomy].** pp. viii + 148. 75 figs., 1 table. Leipzig : Georg Thieme. [3rd Edit.] [8vo] [RM.6.50].

The appearance of a third edition of this book, revised by Voss, since its original publication in 1925, is sufficient indication of its popularity among students. The subject matter has been thoroughly revised and brought up to date, and the illustrations are in the form of exceptionally clear pen and ink drawings, which illustrate more clearly to the student the essential structure of tissues than is the case with photomicrographs. By the use of such drawings, and the exclusion of all irrelevant matter, the size and price of the book remain unaltered. As before, the aim of the authors is to present to the student the most elementary facts of histology, and this aim appears to have been well fulfilled.

The first 30 pages are devoted to a description of the cell and the remainder of the book deals with the structure of the various organs and systems in the order usual in text-books of histology. In all cases the mere essentials have been given, but nothing of vital importance appears to have been omitted. With the amount of space devoted to each particular organ, there may be some disagreement ; for example, the skin received two pages of illustrations whilst the kidney is represented by a single diagram. At the end of the book is a very brief account of the essentials of histological technique and an index which is not always accurate.

The paper and printing are those usual in this series and include a wide right-hand margin for notes.—E. G. WHITE.